

INTRODUCTION TO SUSTAINABILITY (BIOL 205/4)

Course Outline: January 2016

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

Instructor:	Dr. Jim Grant, Department of Biology Office: SP-455, Phone: 848-2424 ext. 3421, Email: james.grant@concordia.ca Office hours: none; email/phone for an appointment. Hint: contact me first thing in the morning for an appointment later that day.
Teaching Assistant:	Andre Baril, SP-401.07; andre_t-b@hotmail.com; see him after the tutorial or email for an appointment (put BIOL 205 in the subject line).
Lectures:	Mondays & Wednesday, 845-1000, Loyola Campus, SP-S110
Tutorials:	Monday & Wednesday: 1015-1145, Loyola Campus, CC-405
Course Description:	The course will begin with an introduction to the science of ecology and to the concept of sustainability as an ecological principle. The concept of sustainability will then be broadened to include humans, as students are introduced to ethics, economics, and resource management from an eco-centric point of view. Students will be encouraged to think critically about the major issues facing humanity today.
Prerequisites:	None
Objectives:	Students will learn the fundamental principles of ecological theory, and then apply this knowledge to consider the major issues of our time. Students will do most of the teaching in the tutorial periods.
Required	No required texts. Readings are listed below – some are required, some are for supplementary purposes only, and some may be added later. I will tell you in lecture when to read them. All are posted electronically on the course reserve at the library.
Academic Misconduct:	Copying from other students or from other sources without proper acknowledgement is plagiarism " the presentation of the work of another person as one's own or without proper acknowledgement " (see Article 17.10.3 III of the Undergraduate Calendar).
What are you responsible for?	In decreasing order of importance: (1) what we cover in class, (2) any assigned readings, (3) what is covered in tutorials.
What to do if ill?	There will be no make-up test. Email me before the test to let me know that you are ill or have some legitimate reason (e.g. religious holiday or funeral) for not writing. Bring in a medical note or other reasonable evidence (e.g. obituary)

by the next class and I will increase the value of your final exam to compensate for the missing test.

Evaluation:	Mid-term test (Feb. 15?)	20%
	Letter to the editor	10%
	Participation in tutorials	10%
	Oral Presentation	20%
	Optional* Exercises	5-20%
	Final Exam	20-35%

“Optional Exercises”:
 Students will be expected to participate in at least one “optional” exercise (worth 5% of their grade) and are encouraged to get involved in exercises worth up to 20% of their final grade. Examples of these optional exercises are listed below, but students are also encouraged to come up with projects on their own – just get them pre-approved by me. Any oral presentations related to an optional exercise will be presented in the tutorial periods. I will count your best grade on the optional exercises for the required 5%; all other grades on optional assignments will only count if they are higher than your grade on the final exam.

Oral version of your letter to the editor (5-7 min: in class)	5%
Attend a special lecture/event and provide a critique (max of 1)	5%
Attend a special lecture/event and report back to class (max of 1)	5%
Introduce and critique a youtube video on sustainability to the class (1)	5%
Individual project – would replace the seminar (make a pitch to me)	20%

Grading scheme: A+ ≥90, A=85-90, A- =80-85, B+=77-80, B=73-77, B- =70-73, C+=67-70, C=63-67, C- =60-63, D+=57-60, D=53-57, D- =50-53, F<50

A Very Tentative Schedule of Lectures

<u>DATE</u>	<u>ACTIVITY</u>
Jan 6	Course Description. What is sustainability?
Jan 11	What is ecology?
Jan 13	I - Populations evolve
Jan 18	II – Species Co-evolve
Jan 19	Deadline for withdrawal with tuition refund
Jan 20	III - One true tree of life
Jan 25	Ecological Ethics
Jan 27	IV – Populations fluctuate in abundance
Feb 1	V – Populations cannot grow indefinitely
Feb 3	VI – Sustainable harvest is possible
Feb 8	VII – Communities are composed of interacting species
Feb 10	VIII – Every species has its niche
Feb 15	Midterm test

Feb 17	IX – Patterns of biodiversity are predictable
Feb 22 & 24	Midterm break
Feb 29	X – Communities are always changing
Mar 2	XI – Energy flows and dissipates
Mar 7	XII – Nutrients cycle
Mar 9	XIII – Ecosystems provide services
Mar 13	Deadline for academic withdrawal
Mar 14	XIV – Common property resources are likely to be over-exploited
Mar 16	XV – Humans are cooperative by nature
Mar 21	Ecological economics
Mar 23	Ecological footprints
Mar 28	Easter: no class
Mar 30	Case Study I
Apr 4	Case Study II
April 6	Case Study III
Apr 11	Case Study V
Apr 14	Makeup day/Review

Required Readings (more about this in class): Check course reserve for BIOL 205

- Orr, David. 1991. What is education for? <http://www.context.org/iclib/ic27/orr/>
- McKibben, Bill. 1998. A Special Moment in History, Part I. The Atlantic Monthly, May 1998.** <http://www.theatlantic.com/magazine/archive/1998/05/a-special-moment-in-history/377106/>
- Chapter 2, Our Common Future: Towards sustainable development. Read the first 15 paragraphs. The concept of sustainable development. <http://www.un-documents.net/ocf-02.htm#I>
- Darwin, C. 1859. On the origin of species. Introduction. <http://www.talkorigins.org/faqs/origin/introduction.html>
- Leopold, Aldo. 1948. A Sand County Almanac. The Land Ethic. Read the complete chapter, but pay attention to the last section entitled “The Outlook”. <http://home.btconnect.com/tipiglen/landethic.html>
- Henry David Thoreau. 1854. Walden, Chapter 2 (Paragraph 16) <http://thoreau.eserver.org/walden02.html>
- Scherbov, S, Lutz, W & Sanderson, WC. 2011. POPULATION AND DEVELOPMENT REVIEW 37: 571-578. <http://0-dx.doi.org/mercury.concordia.ca/10.1111/j.1728-4457.2011.00435.x>
- Darimont, CT**, Fox, CH, Bryan, HM, Reimchen, TE. 2015. The unique ecology of human predators. Science 349: 858-860. <http://0-dx.doi.org/mercury.concordia.ca/10.1126/science.aac4249>
- Worm, B. 2015. A most unusual (super) predator. Science 349: 784-785. <http://0-dx.doi.org/mercury.concordia.ca/10.1126/science.aac8697>
- Carson, Rachel. 1962. Silent Spring. Read chapters 1 and 2. A Fable for Tomorrow and the Obligation to Endure. http://www.gd-maroc.info/fileadmin/user_files/pdf/renforcement_capacite/Module_10_Silent_Spring.pdf
- Costanza, R. et al. 2014. Time to leave GDP behind. Nature 505: 283-285. <http://0-search.ebscohost.com/mercury.concordia.ca/login.aspx?direct=true&db=a9h&AN=96408016&site=ehost-live&scope=site>
- Costanza, R. et al. 1997. The value of the world's ecosystem services and natural capital. Nature 387: 253-260. [http://0-dx.doi.org/mercury.concordia.ca/10.1016/S0921-8009\(98\)00020-2](http://0-dx.doi.org/mercury.concordia.ca/10.1016/S0921-8009(98)00020-2)
- 13.** Untangling the Environmentalist's Paradox: Why is Human Well-Being Increasing as Ecosystem Services Degrade? Ciara Raudsepp-Hearne, Garry D. Peterson, Maria Tengö, Elena M. Bennett, Tim Holland, Karina Benessaiah, Graham K. MacDonald and Laura Pfeifer. [BioScience](#) Sep 2010 : Vol. 60,

- Issue 8, pg(s) 576-589. <http://0-search.ebscohost.com/mercury.concordia.ca/login.aspx?direct=true&db=a9h&AN=53450412&site=ehost-live&scope=site>
14. Ostrom, E. 2009. A general framework for analyzing sustainability of social-ecological systems. *Science* 325: 419-422. <http://0-dx.doi.org/mercury.concordia.ca/10.1126/science.1172133>
 15. Hardin, G. 1991. Carrying capacity and the quality of life. *The Social Contract*, Spring 1991: 195-196. <http://reserves.concordia.ca/ares/ares.dll/plink?1414DF7B>
 16. McKibben, Bill. 1998. A Special Moment in History, Parts 2 & 3. *The Atlantic Monthly*, May 1998. <http://www.theatlantic.com/past/docs/issues/98may/special1.htm>
 17. Paul R. Ehrlich and Anne H. Ehrlich. 2013. Can a collapse of global civilization be avoided? *Proc. R. Soc. B* 2013 **280**, 20122845, published 9 January 2013. <http://0-dx.doi.org/mercury.concordia.ca/10.1098/rspb.2012.2845>
 18. Steffen, W. et al. 2015. Planetary boundaries: guiding human development on a changing planet. *Science* 347: 736-?? <http://0-dx.doi.org/mercury.concordia.ca/10.1126/science.1259855>

Optional Readings

19. Dawkins, R. 1996. The blind watchmaker. Chapter 10, One true tree of life, page 255-286. http://terebess.hu/keletkultinfo/The_Blind_Watchmaker.pdf

Letter to the Editor

Each student will find an article in a newspaper that is related to any part of our course or to any issue related to sustainability. You can show me the article ahead of time if you are wondering if it is appropriate for the assignment. Letters to the editor should be full of passion, clear writing and should display the use of concepts from the course. Pick a controversial article or one that is easy to critique (have a look at the National Post, the Globe and Mail, the Montreal Gazette – they are on the web and in the Concordia library). Your grade will be based half on the use of concepts from the course in your arguments (passion is great, but we also want logical arguments based on science, but don't come across too much like a science geek) and half on the clarity of writing. **See my note about plagiarism in the course outline. I want to see your thoughts and words – do not copy from other sources.**

Here are the rules:

Write 200-300 words (TA will stop reading at 300 words). See examples in newspapers.

Deadline for submission: the sooner the better; email the TA anytime on or before April 11th – late penalty is 10% per day. Marking will be more lenient for submissions early in the semester.

When you submit, email the TA a link/copy of the **original newspaper article**.

50% of your grade: clear, logical writing

50% of your grade: use of sustainability concepts in a non-technical manner

I also encourage you to submit your letter to the newspaper for publication. If you get it published in a reputable* newspaper (and can provide evidence), I will add **2.5 marks** to your overall grade out of 100. You might want to shorten your letter before submitting it to a newspaper. You can try for this bonus mark more than once. I will accept letters published in the Globe and Mail, the National Post, and the Montreal Gazette. Other newspapers are possible, but check with me first.

Oral “letter to the editor”

Each student is invited to make a 5-7 min oral presentation on one article from a local or national newspaper that is relevant to the material covered in BIOL 205. Your 5-7 min oral presentation should provide a brief overview of the content of the article and how it relates to concepts learned in BIOL 205 (1-2 min max) and then a 4-6 min “oral letter to the editor” (i.e. a critique of the tone, argument, or misleading statements of the article). Use concepts learned in BIOL 205 in your critique. You will be graded on the clarity of the oral presentation, how you connected the article to the content of our course, your use of sustainability concepts in your critique, and the quality of your arguments.

The rules for an oral letter

1. You can either (i) reserve a date and then search for articles in the papers the week before to find an article, or (ii) find an article first and then contact me right away to give a presentation. If you reserve a spot and then back out without giving me at least two days’ notice, then you get zero for the assignment and it will count on your final grade.
2. First come, first served regarding the scheduling of oral presentations!
3. Show up **early** on the day of your presentation, in case there are problems loading your presentation onto the class computer; you **cannot** use your laptop.
4. If you are using PowerPoint, email it to me the day before. I will bring it to class; this method will allow me to verify that it works on my computer. Also bring a copy on a memory stick (just in case).

Present a video to the class

Students can also find a short youtube video (max 5 minutes) to present to class – run it by me first. The student should provide a brief introduction to the video (1 minute) by explaining how it is related to the content of the course or the principles of sustainability. Afterwards, the student will provide a critique of the video and/or say why it is important (2-4 minutes) and answer questions from class.

Tutorial Readings

1. **Orr, David. 1991. What is education for?** <http://www.context.org/iclib/ic27/orr/>
2. **McKibben, Bill. 1998. A Special Moment in History, Part I. The Atlantic Monthly, May 1998.** <http://www.theatlantic.com/past/docs/issues/98may/special1.htm>

Tentative Tutorial Schedule

Dates	Who Attends (TA will assign)	Topic
1. Jan 18, 20	1 st half of the tutorial class.	Reading: What is education for?
2. Jan 25, 27	2 nd half of the tutorial class.	Reading: What is education for?
3. Feb 1, 3	1 st half	Reading: A special moment in history - 1
4. Feb 8, 10	2 nd half	Reading: A special moment in history - 1
Feb 15, 17	No tutorials – midterm test week	
Feb 22, 24	No tutorials – midterm break week	

5. Feb 29, Mar 2	1 st half	Student Presentations?
6. Mar 7, 9	2 nd half	Student Presentations
7. Mar 14, 16	1 st half	Student Presentations?
8. Mar 21, 23	2 nd half	Student Presentations?
9. Mar 30, Apr 4	1 st half	Student Presentations?
10. Apr 6, 11	2 nd half	Student Presentations?

Tutorial Periods

Each student will be responsible for: (1) attending all their assigned tutorial periods; (2) submitting a 50-100 word comment on each reading **by midnight on the day before the tutorial (late penalty -10% per day)** via email to the TA; and (3) participating in the class discussion during the tutorial period. Class participation in tutorials will be based on these three components.

Student Presentations during Tutorials

Students (alone or in pairs) can participate in the teaching of the course during tutorials. Students can present a short seminar of 10 minutes (20 minutes for pairs) in duration, leaving time for questions, debate and discussion. I want these presentations to be lively, interactive sessions. Presentations will provide detailed analyses of topics or case studies in the literature to complement the broader-brush approach taken in lecture. Some possible seminar topics include:

The pros and cons of:

- Spilling 8 billion litres of sewage into the St. Lawrence River
- Genetically modified crops
- Organic farming
- Oil pipelines
- Tar sands oil
- Farmed salmon vs farmed steak
- Triaging endangered species
- Culling wolves to save woodland caribou
- Tolls on bridges
- Hunting
- Sport fishing
- Aquaculture
- Paris Agreement from COP 21
- Fracking
- Nuclear power
- Hydroelectric power

Sign up for a topic (or come up with one) and date with the TA. Each student or pair has to find a short paper on your subject that is published in an academic journal as a reference for students in the tutorial. Email the TA a pdf of the paper one week before your seminar. Students in the tutorial will read the paper before the presentation and email their comments to the TA before midnight on the day before the tutorial.

Important Resources:

Chair of Biology: Dr. Pat Gulick, SP-375.1, patrick.gulick@concordia.ca, ext. 3390

Head of Advising for Biology: Dr. Ian Ferguson, SP-375.27, ian.ferguson@concordia.ca, ext. 3425

Undergraduate Program Assistant, Biology: Ms. Leonie Morris, SP-375.9, leonie.morris@concordia.ca, ext. 3400

Counselling and Development: <http://cdev.concordia.ca/>

Library and Citation Style Guides: <http://library.concordia.ca/help/howto/citations.html>

Advocacy and Support Services: <http://supportservices.concordia.ca/>

Student Transition Centre: <http://stc.concordia.ca/>

New Student Program: <http://newstudent.concordia.ca/>

Access Centre for Students with Disabilities: <http://supportservices.concordia.ca/disabilities/>

Student Success Centre: <http://studentsuccess.concordia.ca/>

Academic Integrity Website: <http://www.concordia.ca/students/academic-integrity.html>

Financial Aid and Awards: <http://faao.concordia.ca/main/>

Health Services: <http://www-health.concordia.ca/>