

Faculty of Science Course Syllabus (Section A)
Department of Biology
BIOL 4065 Sustainability and Complexity
Fall 2022

*Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq.
 We are all Treaty people.*

Instructor: Patricia Lane **E-mail:** patricia.lane@dal.ca

Office hours by appointment on Microsoft Teams

Lectures: *asynchronous, lecture and slides posted on Brightspace*

Other: *asynchronous, tutorial videos, and activities on Brightspace*

Course Description

Sustainability is a transdisciplinary area integrating equitable societies, protected environments, and robust economies. Achieving sustainability is a challenge that to date has had limited success in our complex world. Complexity studies offer new approaches for achieving sustainability beyond the traditional ones that have been mostly focused upon reducing unsustainability and using the machine model as a worldview. Simply reducing unsustainability has repeatedly fallen short of the goal of achieving sustainability.

Course Prerequisites

BIOL 2060.03 (or BIOA 3001.03) or ERTH 2410.03 or GEOG 2100X/Y.06 or GEOG 2201.03 or GEOG 2202.03 or INTD 2001.03 or INTD 2002.03 or OCEA 2001.03/2002.03 (or OCEA 2000X/Y.06) or SUST 2000.06 or SUST 2001.06 RESTRICTIONS: E1, E2, E3 Restricted to students in: Faculty of Science, College of Sustainability and International Development students in FASS

Learning Objectives/Outcomes Be able to:

1. Interpret Sustainable Development (SD) as a trans-disciplinary concept requiring complex systems thinking.
2. Contrast some of the major controversies in SD especially over what is to be sustained.
3. Understand complexity as an emerging worldview and its potential applications for human development.
4. Contrast North and South SD approaches – how can complexity theory help bridge the gap?
5. Explain how reducing unsustainability is not the same as achieving sustainability.
6. Undertake critical thinking about sustainability and flourishing.
7. Make use of a variety of sustainability tools, methodologies, and models.
8. Construct and analyze systems models featuring SD and complexity theory.
9. Map SD systems using Plectica systems software.
10. Interpret global sustainability indices for your study country.
11. Understand wicked problems in SD from a systems point of view.
12. Produce a creative, insightful final paper that integrates the course information to answer a relevant question.

Course Materials and Communications

- Required textbook(s):
 - (1) Systems Thinking Made Simple: New Hope for Solving Wicked Problems by Derek and Laura Cabrera. 2nd Edition. 2015. Available on Amazon.ca as paperback, or electronically downloaded to a Kindle or a Kindle app for your computer.
 - (2) A New World System. From Chaos to Sustainability by Donald G. Reid. Earthscan from Routledge. 2021. Available at the SUB Bookstore.
 - (3) What's the Worst that Could Happen? Existential Risk and Extreme Politics by Andrew Leigh. 2021. The MIT Press. Available at the SUB Bookstore.
- Course Brightspace web site with captioned Panopto lectures.
- e-journal articles from Dalhousie Library
- Online platform outside Brightspace: Microsoft Teams – Office 365 for one-on-one meetings.
- Email-class messages, reminders, and announcements will be sent to all students via Brightspace but a student should post only to the discussion board to ask a question about class content or procedures. Questions will not be answered via Dr. Lane's personal email. (patricia.lane@dal.ca)
 - A student should request a virtual meeting by contacting Dr. Lane. (patricia.lane@dal.ca)
 - A student should contact Dr. Lane about lateness and missed work.
 - A student should email the Marker directly to ask a question about marking.

Course Assessment

Component	Weight	Date Due (all due 11:59 pm AST)
Module Assignments 1-10	10 modules @ 8 pts each = 80	Sept 11, 18, 25; Oct 2, 9, 16, 23, 30; Nov 13, 20- all Sundays
Term Paper	20	December 7 (Wednesday)
Total	100 pts.	

Online Course Delivery and Other Requirements:

1. There are no synchronous components and no ungraded components.
2. 10 Module Assignments and the term paper will be submitted (typed) online for originality checking by 11:59 pm on date due on our Brightspace website. Points will be deducted for lateness.
3. You will need a computer to access website and course materials, and a camera and microphone for online meetings There are no synchronous components and no ungraded components. No course components require on-campus attendance.
4. Students connecting to online resources from outside Canada are responsible for ensuring awareness and compliance with any applicable laws in the country from which they are connecting.

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

BIOL. 4065 Sustainability and Complexity 2022 Class Content/Schedule

All Module Assignments are due at 11:59pm Atlantic Standard Time (AST) on first Sunday following last day (Saturday) of end of the week as listed below. Term paper due date is Dec 7.

Modules contain detailed reading assignments not listed here Readings #1-10.

WEEK	MODULE/ASSIGNMENT	ASSIGNMENTS
1. Sept 7-11	Module 1-Introduction to Sustainability, Complexity, Systems Thinking, Wicked Problems, and Flourishing Assignment 1-Your Twin and his/her Country	Module 1 Reading 1 Module 1 Due Sept 11
2. Sept 12-18	Module 2-The World Is Complex and Unsustainable with Global Situation-Connected but Fragmented Assignment 2-Country Statistics & Human Development Index	Module 2 Reading 2 Module 2 Due Sept 18
3. Sept 19-25	Module 3-Complexity Theory and Paradigm Shift Changing an Approach That Is Not Working Assignment 3-The Ecological Footprint	Module 3 Reading 3 Module 3 Due Sept 25
4. Sept 26- Oct 2	Module 4-Systems Thinking in Sustainability & Complexity in Environmental Systems-Are Resilient Ecosystems Possible? Assignment 4-Case Study-SWOT (Note: Sept 30 is National Day for Truth and Reconciliation-University Holiday)	Module 4 Reading 4 Module 4 Due Oct 2
5. Oct 3-9	Module 5-How Can Societies Be Sustainable with Social and Environmental Justice? Assignment 5-Comparing Development & SD Indicators	Module 5 Reading 5 Module 5 Due Oct 9
6. Oct 10-16	Module 6-Sustainability/Complexity in Human Development-Cuban Case Study + Textbook Case Studies Assignment 6- UN SD Goals/SD Index/Sustainability Toolbox	Module 6 Reading 6 Module 6 Due Oct 16
7. Oct 17-23	Module 7-Sustainability/Complexity in the Economy-How Well Does Model B Promote Sustainability? Assignment 7-Valuing Cuban Biodiversity	Module 7 Reading 7 Module 7 Due Oct 23
8. Oct 24-30	Module 8-Model A Steady State Economy Compared to Neoclassical Economics Model C Assignment 8- Sustainability Assessment	Module 8 Reading 8 Module 8 Due Oct 30
9. Oct 31-Nov 6	Module 9 Wicked Problems Everywhere: Neoliberal Globalization Assignment 9-Wicked Problems in Your Country Thwarting Sustainability	Module 9 Reading 9 Module 9 Due Nov 13
STUDY WEEK-Nov 7-13 -NO NEW MODULE		
10. Nov 14-20	Module 10 Sustainability in a Pandemic Assignment 10. Summing Up Pandemic Impacts on Your Country	Module 10 Reading 10 Module 10 Due Nov 20
11. Nov 21-27	Work on Term Paper: Sustainability Transition or Not to 2050	Work on Term Paper
12.Nov 28- Dec 3	Review and Feedback	Term Paper Due December 7 by 11:59pm

Course Policies (See also university policies and websites on last pages of this syllabus.)

You will not receive a letter grade lower than what is indicated for your final point value listed above, although the professor reserves the right to give you a higher grade. Because the scale is generous for A's and B's (30 points) as compared to C's and D's (20 points), individual marks will only be rounded up if the student has more than 0.50 above the maximum value for a particular letter grade. For example, if you received 79.51 points, you would receive an A- in the class and not a B+. If you received 79.49 points, you would receive a B+ and not an A-. A grade is something you earn. If you require a final grade at a particular level for an honours degree, job, graduate or professional school, or other purpose, you should ensure that you put the time and effort in during the term to earn that grade. The Professor is willing to give you extra help and study assignments if you believe that you are not achieving a satisfactory level of proficiency in the class. Please do not come at the end of the term requesting a higher grade because you need it to fulfil a requirement, enter graduate school, you worked hard, or because you paid your tuition. These are not satisfactory reasons. It is unfair to the other students in the class who have done the work, and to the university, which needs to maintain fair and high standards of academic achievement. Although assignments will have a detailed point distribution for marking, the Marker has discretionary power to deduct additional points (up to 10%) for overall sloppy writing, poor grammar and spelling, messy format, inadequate referencing, and overall inferior quality of the assignment. All assignments are to be typed and spell & grammar-checked before submission.

Individual Work and Plagiarism

All work in this class is to be done individually. The 10 Module Assignments should be typed, and spell/grammar checked before being submitted to the originality evaluation on our website. Your term paper also will be checked for originality. All instances of suspected plagiarism will be reported promptly to the Academic Integrity Officer of the Faculty of Science.

Absences, Lateness, and Missed Work

Use the Student Declaration of Absence form for missed academic requirements in this course if you are ill for more than 3 consecutive days (not 3 class days) as per university policy. A submission site for your declaration is given on the class website on Brightspace. Two submissions are permitted per term. The possibility of making up late work is at the discretion of the professor. "Students experiencing recurring long-term absences are strongly encouraged to meet with a Faculty or Declared Major Advisor, or Faculty Program Coordinator and refer to the University's Student Accommodation Policy." We do not have the possibility of offering alternative assignments or changes in weighting of points per requirement. Any material submitted for evaluation after the designated deadline will have marks deducted at the rate of 10% per day late including weekends. Extensions without the mark penalty will be given only with a valid Student Declaration of Absence or other excuse as approved by the professor. If you file a Student Declaration for a short-term absence from class, you need to follow-up immediately with Dr. Lane on when the missed work is due. We do not have the possibility of offering alternative assignments or changes in weighting of points for requirements.

Faculty of Science Course Syllabus (Section B) (revised April-2022)
Fall/Winter 2022-23

BIOL 4065 Sustainability and Complexity

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

<https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=117&chapterid=-1&topicgroupid=31821&loaduseredits=False>

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Faculty of Science Course Syllabus (Section C) (revised April-2022)

Fall/Winter 2022-23

BIOL 4065 Sustainability and Complexity
Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html>

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness.html

Student Advocacy: <https://dsu.ca/dsas>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

Dalhousie COVID-19 information and updates: <https://www.dal.ca/covid-19-information-and-updates.html>