

BIOL 4065 Sustainability and Complexity Syllabus

Department of Biology



Course BIOL 10362 Tutorial BIOL 14255 Fall 2024

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.

Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.

Course Instructor(s)

Name	Email	Office Hours
Dr. Patricia Lane, Professor	patricia.lane@dal.ca	Online, as requested
Cara Cripton-Inglis Teaching Assistant	cr339064@dal.ca	Online, as requested
Dr. Christopher Course Technical Support	ch608098@dal.ca	Online, as requested

Course Description

Sustainability is a transdisciplinary area integrating equitable societies, protected environments, and robust economies. Achieving sustainability is a challenge that has only had limited success in our complex world. Complexity studies offer new approaches for achieving sustainability beyond the traditional ones mostly focused upon reducing unsustainability. NOTE: Course open to students in: Faculty of Science, College of Sustainability, and International Development students in FASS

Course Prerequisites

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

Student Resources

The Teaching staff are available to you online during business hours. In addition, you will be online synchronously with Ms. Cara Cripton-Inglis for a one hour tutorial each week. Our Brightspace also includes two Discussion Boards, where you can submit questions to the Professor on overall course content and to the Teaching Assistant on tutorial content. Our website also contains websites and documents with additional Information to help you understand the course content.

Course Structure

Course Delivery

The course is blended with synchronous online for 7 tutorials and asynchronous online for the rest of the course content. Tutorials will be recorded, attendance taken, and participation marked. Tutorial 1 will occur on Monday at 1305-1355 pm September 9 in the second week of class. Although no parts of the class require on campus attendance, those 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. There will be one online test in November and students must be available to complete the test during the assigned hours-see Course Outline and put the date and time in your schedule at the beginning of term. Dr. Course is the 'go-to' person for technology issues in the course.

Lectures-lectures are online and asynchronous.

Tutorials-are held synchronously on Mondays at 1305-1355 pm beginning September 9, 2024 as per the Course Schedule below.

Course Materials

- ❖ Required textbook: Authors: Walter Erdelen and Jacques G. Richardson. Title: Managing Complexity : Earth Systems and Strategies for the Future. Routledge Press. 2019.
Note: the text is available online as a Kindle Book at the Amazon Website (\$69.87). If you do not have a Kindle E-Book Reader, you will need to download the Kindle App. OR you can order the paperback version (\$71.44) directly from Amazon.
- ❖ See course Brightspace page under Content tab for Panopto lectures. Slides are posted separately.
- ❖ You will need a computer with camera & microphone to participate in online tutorials.
- ❖ e-journal articles from Dalhousie Library
- ❖ Any online platforms outside Brightspace-Microsoft Teams: Office 365 for meetings.
- ❖ Email-class messages, reminders, discussion board questions, and announcements will be sent to all students via Brightspace.
- ❖ A student should post only to the discussion board to ask a question about class content or procedures. Course content questions will not be answered via Dr. Lane's personal email and you will be directed back to the Discussion Board.

- ❖ A student should request a virtual meeting by contacting Dr. Lane at Patricia.Lane@Dal.Ca or to communicate any emergency or personal issue regarding the course.
- ❖ Contact our Teaching Assistant, Cara Cripton-Inglis at cr339064@dal.ca for questions concerning tutorials and all marking. If you are not satisfied after first discussing your issue with the Teaching Assistant, then discuss it with Dr. Lane but you must speak with the TA first.
- ❖ A student should email Dr. Course at ch608098@dal.ca directly to ask a question about a technical or Brightspace issue.

Assessment

Component	Weight (% of final grade)	Date Due
Assignment 1	10	Sept. 28, Saturday, midnight submit online
Assignment 2	10	Oct 19, Saturday, midnight submit online
Test (multiple choice)	27	Nov 9, 1:30-3:30 pm, online Saturday
Term Paper	25	Dec 3, Tuesday, midnight submit online
7 Tutorials @ 4 pts each (1 pt for attendance and 3 pts for participation)	28	Marked in tutorial at your scheduled day and time-See Course Content and Schedule p. 6
Total	100	

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)	

Test Conflict

If you have a conflict for the scheduled online test on November 9, 2024, please let the Dr. Lane know at least 4 weeks in advance to make earlier accommodations. Later accommodations after November 9th will not be possible. The online test will be given from 1:30-3:30 pm on Sunday, November 9, 2024 and is to be completed individually. The test is multiple choice with four possible answers per question on Weeks 1-10 material including tutorials. There are 54 questions that will be randomly generated from a large bank of questions for each individual test. Thus, each student will have a different test. Each right answer earns 0.5 points for a total of 27 points. You will have 1 minute to answer the question and then a new question will appear. You will not be able to return to a previous question so

give your best answer within the time limit. There is no penalty for guessing or wrong answers. No online proctoring software will be used. More instructions will be posted on our Brightspace website. **The course does not have a final examination.**

Course Policies on Missed or Late Academic Requirements

Use the Student Declaration of Absence (SDA) form for missed academic requirements in this course if you are ill for more than 3 consecutive days (not 3 class days) or have extenuating circumstances as per university policy. A submission site for your SDA is given on the class website on Brightspace. Two SDA submissions are permitted per term. **The possibility of making up late work is at the discretion of the Professor but for each SDA you will have one week automatically from the original due date to submit the assignment without penalty. SDAs cannot be used to miss tests.** Any material submitted for evaluation after the designated deadline or the SDA one week 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 SDA or other excuse as approved by Dr. Lane. If you file a Student Declaration for a short-term absence from class, you need to follow-up with Dr. Lane if you will not submit within one week. **We do not have the possibility of offering alternative assignments or changes in weighting of points for requirements-please do not ask for special treatment that is not fair to everyone.** “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”.

Course Policies related to Academic Integrity

ALL WORK IN THIS CLASS IS TO BE DONE INDIVIDUALLY except the online-tutorial discussions you may have with your tutorial members and Instructor/PTA on the readings. Do not collaborate on the 2 assignments; they will be checked for originality using plagiarism software. **DO NOT SHOW ANYONE YOUR WORK** or you too can be charged with plagiarism. All instances of suspected plagiarism will be reported promptly to the Academic Integrity Officer of the Faculty of Science. **YOU ARE NOT ALLOWED TO USE GENERATIVE AI AND LARGE LANGUAGE MODELS (e.g., ChatGPT)** in preparing Assignments 1-2 and the Term Paper; they must be totally original. You can quote other authors using their name(s), year, and page number of a publication referenced in your bibliography, but overall quoted passages should not exceed 5-7% of your assignments. Points will be deducted if you exceed this limit.

Course Policies Related to Grading and Marking

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-. The final grade that you receive in a class is the total of the work that you did and the knowledge that you gained. A grade is something that 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.

Learning Objectives

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. Understand wicked problems in SD from a systems point of view.
10. Produce a creative, insightful final paper that integrates the course information to answer a relevant question.

BIOL 4065 Course Content and Schedule (Key dates are in red.)

WEEK	LECTURE/TUTORIAL	ASSIGNMENTS
1 Sept 3-7	Lecture 1-Introduction, Sustainability and Complexity No Tutorial This Week	Text: Chap. 1
2 Sept 8-14	Lecture 2-Planetary Boundaries and Disturbances Tutorial 2	Text: Chap. 2 Tutorial Reading 2
3 Sept 15-21	Lecture 3-Sustainability's Slow Progress-Global Governance Tutorial 3	Text: Chap. 14 Tutorial Reading 3
4 Sept 22-28	Lecture 4-Foresight, Education, Science Tutorial 4	Text: Chap. 3-4-5 Tutorial Reading 4 Assignment 1 due midnight Sept.28 (Saturday)
5 Sept 29- Oct 5	Lecture 5-Industry and Economy No Tutorial This Week (Note: Sept 30, Monday, is National Day for Truth and Reconciliation-University Holiday)	Text: Chap. 6 Tutorial Reading 5 Reading-Economy-Environ.
6 Oct 6-12	Lecture 6-Ethics and Society Tutorial 6	Text: Chap. 7
7 Oct 13-19	Lecture 7-Water, Biodiversity, Migration No Tutorial This Week (Note: October 14, Monday, is Thanksgiving Day)	Text: Chap. 8-9, 13 Tutorial Reading 7 Assignment 2 due midnight Oct 19 (Saturday)
8 Oct 20-26	Lecture 8- Global Climate Change, and Military Tutorial 8	Text: Chap. 10, 12 Tutorial Reading 8
9 Oct 27-Nov 2	Lecture 9-Trade, Globalization and Diplomacy Tutorial 9	Text: Chap. 11 Tutorial Reading 9
10 Nov 3-9	Topic 10- Achieving Sustainability versus Reducing Risk Tutorial 10	Text: Chap. 15 Tutorial Reading 10 Online Test Nov 9, 1:30-3:30 pm (Saturday)
STUDY WEEK-Nov 11-16 -NO NEW MATERIAL (Note: Nov 11 is Remembrance Day)		
11 Nov 17-Nov 23	No Lecture, Tutorial, or New Material This Week Work on Term Paper	Work on Term Paper
12 Nov 24-Dec 3	No Lecture, Tutorial, or New Material This Week Submit Term Paper	Term Paper Due Dec 3 Midnight-online-Tuesday

University Policies and Statements

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 at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/campus_life/communities/indigenous.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: <https://www.dal.ca/about-dal/internationalization.html>

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all 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. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html>)

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

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 (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: <http://www.dal.ca/cultureofrespect.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. The full Code of Student Conduct can be found at: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at: <https://www.dal.ca/about/leadership-governance/academic-integrity/faculty-resources/ouriginal-plagiarism-detection.html>

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.