

**Faculty of Environmental and Urban Change
York University**

EU/ENVS 4523 and EU/ENVS 5081 COURSE SYLLABUS

Course: **EU/ENVS 4523** 3.0 and **EU/ENVS 5081** 3.0 “Systems Thinking: How everything is connected to everything else, and what to do about it”

Term: Fall 2021

Calendar Description

This course addresses fundamentals of general and complex systems thinking (such as general systems theory, complex adaptive systems, chaos theory), major paradigms in systems thinking (functionalist, interpretive, emancipatory, postmodern), and their associated methodologies and applications in environmental studies.

Prerequisite(s)

Fourth year standing or by permission of the instructor. Students with Third year standing may have access subject to space availability and approval from the Faculty.

Course Director

Professor Martin Bunch

Course consultation hours: Wednesday, 10:30 – 12:30

Zoom link: <https://yorku.zoom.us/j/8799749833?pwd=MjRlUzNlI5djIjXUVQ2bjhja2ZYbEpDUT09>

Teaching Assistants

Kamal Paudel

Marker/Grader

Course consultation hours:

n/a

Add in zoom/other virtual link

n/a

Course Management/Online Teaching

Please note that this is a course that depends on remote teaching and learning. Unless otherwise specified, there will be no in-person interactions or activities on campus.

The course will be operated in a hybrid SYNCHRONOUS and ASYNCHRONOUS manner. Lectures for most weeks will be pre-recorded and students will be expected to view the lectures and prepare reading reflections prior to the scheduled lecture times. The scheduled lecture time will be used to discuss the assigned readings, provide instruction on course assignments, and for guest lectures and student presentations.

Course materials such as links to readings, videos, lectures and assignments will be available on the course eClass website at <https://eclass.yorku.ca/eclass/course/view.php?id=57149>

All written assignments will be submitted via eClass.

Time and Location

Lectures:

| | | |
|---------|--------------|---|
| Mondays | 2:30-5:30 pm | Unless otherwise arranged, we will <u>always</u> meet as a group during this time to discuss the readings through a live Zoom session. https://yorku.zoom.us/j/8799749833?pwd=MjRUZnI5djJXUVQ2bjhja2ZYbEpDUT09 Please note that the Zoom meetings will be recorded and posted to the course eClass. |
|---------|--------------|---|

Purpose and Objectives of the Course

This course uses systems theory and methods to consolidate many of the broad ideas and concepts related to interdisciplinarity, holism, interconnectedness, and complexity to which environmental studies students have been exposed, and to provide a set of cognitive and applied tools that will allow students to address environmental (and other) problems.

Learning outcomes

Upon completion of this course, students will be able to;

1. articulate a range of systems thinking concepts and theories such as emergence, resilience, complexity, and the ecosystem approach;
2. apply systems concepts to observations of the world;
3. express the relationship of systems epistemology to problem solving methods and frameworks; and
4. apply at least one systems-based method to an environmental problem.

Organization of the Course

Several platforms will be used in this course (e.g., eClass, Zoom) through which students will interact with the course materials, the Course Director, and one another. This course involves formal lectures that will be pre-recorded and uploaded by midnight on Friday evenings. The required readings are central to the course. In addition to completing course readings, students may also be asked to view films, TED talks, listen to podcasts, etc.. A list of weekly required and recommended readings and other materials will be posted to the course eClass website.

This class is scheduled to meet (synchronously, online) for 3 hours on Mondays, from 2:30 to 5:30 pm. Students are expected to (virtually) attend class. Class will always begin at 2:30, but may end earlier than 5:30. This is because most lectures will be pre-recorded. Prior to class students must (1) view the lectures, (2) read the assigned readings, and (3) submit a reading reflection. Doing so prior to class will prepare participants for class discussion and exercises. The synchronous (live online) portion of the class will involve discussion about the lecture material and readings, class exercises, guest lectures, and instruction and support for assignments.

Evaluation

The grade for the course will be based on the following items weighted as indicated:

| <i>Evaluation Point</i> | <i>% Value</i> | | <i>Dates</i> |
|---|----------------|-------------|-------------------------|
| | <i>uGrad</i> | <i>Grad</i> | |
| Class participation (attendance + contribution) | 15% | 12% | Each class |
| Reading reflections (submitted prior to class) | 20% | 18% | Each class |
| Method Presentation | n/a | 15% | Oct-Dec classes |
| System Modelling Project | 25% | 20% | November 1 and 22, 2021 |
| Final Exam | 40% | 35% | Dec. Exam period |

Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

Lateness Penalty

Assignments received later than the due date will be penalized 5% of the value of the assignment **per day** that the assignments are late. For example, if an assignment worth 20% of the total course grade is a day late, 1 point out of 20 (or 5% per day) will be deducted. Late submission of reading reflections will not be accepted. Exceptions to the lateness penalty for valid reasons such as illness, compassionate grounds, etc. will be entertained by the Course Director.

Missed Tests

Students with a documented reason for missing a course test, such as illness, compassionate grounds, etc., may request accommodation from the Course Instructor. When you contact the Course Instructor, state your desired accommodation arrangement (e.g., allowed to write a make-up test on a certain date). Further extensions or accommodation will require students to submit a formal petition to the Faculty.

Brief descriptions of each assignment:

1. Class participation

Students are expected to attend class, actively participate in discussion, and demonstrate via this participation that they have read the required course readings. The table below presents a general guide to the evaluation of class participation used in this course.

| Evaluation criteria for participation | Grades |
|--|---------------|
| <ul style="list-style-type: none">Degrees of absenteeism and associated lack of contribution. | 0-4 |
| <ul style="list-style-type: none">Present, not disruptive.Tries to respond when called on but does not offer much.Demonstrates very infrequent involvement in discussion. | 5 |
| <ul style="list-style-type: none">Demonstrates adequate preparation: knows basic case or reading facts, but does not show evidence of trying to interpret or analyze them.Offers straightforward information (e.g., straight from the case or reading), without elaboration or very infrequently (perhaps once a class).Does not offer to contribute to discussion, but contributes to a moderate degree when called on. | 6-7 |

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| <ul style="list-style-type: none"> • Demonstrates sporadic involvement. | |
| <ul style="list-style-type: none"> • Demonstrates good preparation: knows case or reading facts well, has thought through implications of them. • Offers interpretations and analysis of case material (more than just facts) to class. • Contributes well to discussion in an ongoing way: responds to other students' points, thinks through own points, questions others in a constructive way, offers and supports suggestions that may be counter to the majority opinion. • Demonstrates consistent ongoing involvement. | 8 |
| <ul style="list-style-type: none"> • Demonstrates excellent preparation: has analyzed case, issue, etc. exceptionally well, relating it to readings and other material (e.g., readings, course material, discussions, experiences, etc.). • Offers analysis, synthesis, and evaluation of case material, e.g., puts together pieces of the discussion to develop new approaches that take the class further. • Contributes in a very significant way to ongoing discussion: keeps analysis focused, responds very thoughtfully to other students' comments, contributes to the cooperative argument building, suggests alternative ways of approaching material and helps class analyze which approaches are appropriate, etc. • Demonstrates ongoing very active involvement. | 9-10 |

[criteria adapted from Maznevski, Martha L. (2007) *Grading Class Participation*. Teaching Resources Center, University of Virginia: Charlottesville]

2. Reading reflections

Each week students will write a brief reflection (250-500 words) on the readings assigned for the week. This assignment will be submitted using the submission link on eClass prior to the start of class. Once the class has started the submission link will become inactive. Late submissions of journal reflections will not be accepted. Students will produce 11 reflections, the best nine of which will comprise their grade. Reflections are graded on a five-point scale (0 to 4):

0. Not completed or comprehension of the material not demonstrated
1. Descriptive reporting of the material, comprehension minimally demonstrated
2. Demonstration of a close reading of the material, evidence of comprehension and interpretation
3. Excellent comprehension, e.g., synthesis or analysis, relates and compares to other work.
4. Outstanding: excellent comprehension, plus exceptional skill or great originality in synthesis, analysis.

3. Systems Method Presentation (graduate students only)

Only Graduate Students will undertake this assignment. Students will choose a systems-based technique or method to present to the class. The method should be illustrated by an application or example. The presentation will be 12 minutes long, plus 3 minutes for questions.

4. Systems Modelling Project

Students will use systems models to develop scenarios pertaining to an environmental problem. The assignment has two, parts: (1) Completion of a tutorial in using the NetLogo modelling software, and (2) a report in which students will identify systems properties, compare model scenarios, and identify

learning outcomes of the modelling exercise. This assignment will be completed using the agent-based modelling software “NetLogo.” NetLogo may be downloaded and installed for free (<http://ccl.northwestern.edu/netlogo/>).

5. Final Exam

This examination will be held during the Fall Term examination period in December. Four (4) potential examination questions will be distributed early in the course and a selection of two (2) of these will appear on the final examination, of which the student will answer only one (1).

Required Reading

Required readings will be assigned along with lecture and seminar topics. The reading list will be posted on the course eClass website. All required readings will be accessible via links or downloads in the course eClass website.

Recommended supplementary texts include:

1. Flood R L, Carson E R, (1998) *Dealing with Complexity: An Introduction to the Theory and Application of Systems Science*. New York: Plenum Press.
2. Jackson M C, (2000) *Systems Approaches to Management*. New York: Kluwer Academic/Plenum Publishers.
3. Meadows, Donella (2008) *Thinking in Systems - A primer*. White River: Chelsea Green Publishing Company.
4. Ramage M, Shipp K. (2009) *Systems Thinkers*. New York: Springer. (This book is available **online** through the York Library)
5. Waltner-Toews, D., Kay, J. J., & Lister, N.-M. (Eds.) (2008) *The Ecosystem Approach: Complexity, Uncertainty, and Managing for Sustainability*. New York: Columbia University Press.

Schedule of Topics

The following list of lecture topics is subject to change. The accompanying reading list is available on the eClass website.

Schedule of Topics by week

| <i>Date</i> | <i>Topic</i> |
|--------------------------------|---|
| Week 1 13 Sep | Course Organization; Introduction to Systems Thinking |
| Week 2 20 Sep | Systems concepts, The history of systems thinking |
| Week 3 27 Sep | Systems and Epistemology |
| Week 4 4 Oct | Interpretive, Emancipatory and Critical Systems Thinking |
| 11 Oct | READING WEEK (no class) |
| Week 5 18 Oct | Guest Lecture: Eunice Choi Feedback in systems; Causal Loop Diagrams |

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| Week 6 25 Oct | Representing Systems, System Modelling Introduction to NetLogo and the modelling assignment |
| Week 7 1 Nov | Guest Lecture: David Mallery Complexity I: Complexity and Governance [Netlogo Tutorial Due] |
| Week 8 8 Nov | Complexity II: Complexity Science: Chaos, Catastrophe, Self-organization |
| Week 9 15 Nov | Complexity III: Panarchy and Resilience Theory |
| Week 10 22 Nov | Complexity IV: Complexity Science Applied – The Ecosystem Approach [ABM Modelling Assignments Due] |
| Week 11 29 Nov | Complexity V: Complexity Science Applied – Ecohealth |
| Week 12 6 Dec | Course Review |

Inclusivity in the EUC Undergraduate Programs

Our programs strive to include a broad range of perspectives and substantive material in course offerings. Central to a clear understanding of urban and environmental problems is the link between exploitation of the natural world, and justice issues related to racism, gender inequity, and poverty. An inclusion of non-western perspectives is therefore essential to a fruitful discussion of North-South issues, and environmental debates generally.

Religious Observance Days

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete and Examination Accommodation Form: <https://secure.students.yorku.ca/pdf/alternate-exam-test-rescheduling-request.pdf>

Academic Honesty

As a student at York University, you have a responsibility to not only understand, but also play an important part in upholding the integrity of the academic experience. The Faculty of Environmental and Urban Change supports the International Center for Academic Integrity's [definition of academic integrity](#). That is, you will be committed to acting in all academic matters, even in the face of adversity, with honesty, trust, fairness, courage, respect and responsibility.

How can you demonstrate academic integrity in the completion of your course?

- Respect the ideas of others: Your course work should represent your own knowledge and ideas. You should not falsely claim credit for ideas that are not your own, by presenting another's work as yours. If you are quoting, paraphrasing, or summarizing another person's work in order to support your own ideas, identify the work and the author through proper citation practices. For more information about how to cite properly, use the [Student Papers and Academic Research Kit \(SPARK\)](#). You can improve your writing, research, and personal learning abilities through the [Learning Commons](#).
- Respect your peers: Know when you are allowed to collaborate. Ask your instructor about what group work entails when it comes to the sharing of work. In test situations and assignments, don't steal or give answers to your peers. Cheating and aiding in a breach of academic honesty are both against York University's academic honesty policy.
- Respect your course instructor(s): Understand what the instructors are asking of you in class, in assignments, and in exams. If you are unsure, ask your professor or teaching assistant. They are committed to making you feel supported and want to assess you fairly and with integrity. Please do not submit the same piece of work for more than one course without your instructor's permission.
- Respect yourself: When you act with integrity, you know that your work is yours and yours alone. You do not allow others to impersonate you, or you do not yourself impersonate another person during a test or exam. You do not buy or otherwise obtain term papers or assignments. You do the work. As a result, you know that you *earned* the grades that you receive, so you can be proud of your York degree. By acting with integrity in your course work, you are also practising a valuable professional skill that is important in all workplaces.
- Take responsibility: If you have acted in an academically dishonest way, you can demonstrate courage and take responsibility for your mistake. You can admit your mistake to your course instructor as soon as possible.

Students who engage in academic dishonesty can be subject to disciplinary action under the [Senate Policy on Academic Honesty](#). Your lack of familiarity with the Senate Policy and Guidelines on Academic Honesty does not constitute a defense against their application. Some academic offences can also constitute offences under the Criminal Code of Canada, which means that you may also be subject to criminal charges.

Intellectual property notice

All materials prepared for ENV5 4520 at York University are the intellectual property of **Martin Bunch** unless otherwise stated. Course materials should only be used by students enrolled in this course. This can include but is not limited to the following material: lecture notes, handouts and recordings; assignment handouts and instructions; spoken and written presentations; audio and video recordings; PowerPoint slides; and questions and/or solution sets for assignments, quizzes, tests and final exams.

As a student in this course, you may not publish, post on an Internet site, sell, or otherwise distribute any of this work without the instructor's express permission. Unauthorized or commercial use of these materials is strictly prohibited. Third party copyrighted materials (such as book chapters, 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 material for distribution (e.g. uploading material to a commercial third-party website, or online sharing of course material with people outside of the course) may lead to a charge of misconduct under York's [Code of Student Rights and Responsibilities](#) and the [Senate Policy on Academic Honesty](#). In addition, you may face legal consequences for any violation of copyright law.

Ethical Review of Research Involving Human Participants in Undergraduate Courses

York students are subject to the York University Policy for the [ethics review process](#) for research involving Human Participants. All research activity with human participants must undergo ethical review.

Student Conduct

Students, course instructors and staff have a joint responsibility to create and maintain a welcoming and inclusive learning environment. All students are expected to conduct themselves in accordance with the [Code of Student Rights and Responsibilities](#). Whether online or in-person, students and course instructors are expected to cultivate and sustain a professional relationship characterized by mutual respect and courtesy. In all classrooms, any [disruptive and/or harassing behaviour](#) will not be tolerated. To ensure that you adhere to the rules of the virtual classroom, please review what counts as proper 'netiquette' (the basic rules for communicating with others in online spaces) by consulting the [student guide to e-learning](#).

Please respect the privacy of your peers and instructors. Never share private information about your peers and instructors without their permission. Remember, no aspect of your courses should be recorded or distributed without everyone's consent.

Accessibility

While all students are expected to satisfy the requirements of their program of study and to aspire to achieve excellence, the university recognizes that persons with disabilities may require reasonable accommodation to enable them to perform at their best. For more information about this policy, please refer to these guidelines and procedures: [Academic Accommodation for Students with Disabilities](#).

The university encourages students with disabilities to register with [Student Accessibility Services \(SAS\)](#) to discuss their accommodation needs as early as possible in the term. An Accessibility Counsellor will help you establish recommended academic accommodations, which will then need to be communicated to your course instructor(s) as necessary. **Please let the course instructor(s) know as early as possible in the term if you anticipate requiring academic accommodation, so that your accommodation needs can be discussed and considered within the context of this course.**

Supports

[Student Counselling & Development \(SCD\)](#) aims to help York students realize, develop and fulfill their personal potential in order to maximally benefit from their university experience and manage the challenges of university life. You can get support for a wide range of concerns including, but not limited

to: depression, anxiety, abuse, stress, self-esteem, relationship issues, eating and body image as well as issues related to sexuality.

You can also reach out to your TAs, course instructor, the Undergraduate Program Director, Student Support Coordinator, Peer Mentors, or the Writing Centre if you have questions, comments, concerns or need academic help.