

## School of the Environment

### **COURSE NAME: Urban Sustainability (ENV 307H)**

#### **I CONTACTS**

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#### **INSTRUCTOR**

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#### **TA(s)**

Name: Mia Wang

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#### **TA(s)**

Name: to be confirmed

Email:

Please bring a smart device that can connect to Quercus with you to all lectures that could include laptops, tablets, smart phones. As you would need to participate in the in-class activities.

QGIS software was selected for this course which can be download for free from QGIS website. More information is available here:

<https://mdl.library.utoronto.ca/technology/gis-software>

#### **II COURSE OVERVIEW**

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##### **COURSE DESCRIPTION:**

In this course, students learn about urban sustainability including sustainable urban development and sustainable cities and their relations with sustainable and resilient cities. They are presented with good practices of sustainability and how Smart technologies are helping cities become more sustainable. They will see a city as a complex system and learn about the System Thinking approach and the way it looks at complex systems such as cities. Topics such as green infrastructure, sustainable buildings, sustainable transport, urban agriculture, urban energy, resilience, social sustainability, participatory planning, and geospatial analysis using GIS ... will be discussed. They will be encouraged to identify a Toronto urban problem, collect information, analyze them using GIS, find solutions, and present their scenarios.

### STUDENT LEARNING OUTCOMES:

By the end of this course, students will:

Become aware of cities, urban infrastructure, transport and transit systems, urban energy, and cities challenges in the climate change era

Gain an understanding of sustainable development and urban sustainability and their relation to Resilient and Smart City

Become familiar with data collection (field studies) and different data presentation tools

Identify urban problems in Toronto and describe them from environmental, social, and economical perspective

Understand a comprehensive/holistic view to see the bigger picture by using System Thinking methods and tools such as causal loops, behavior over time patterns, and ice-berg model

Identify and develop data collection tools and measures to perform their research

Link different types of data to analyze the information using GIS system

Visualize data and map them to present the results

Be able to work in a team

Become aware of Transform TO and environmental sustainability programs by the City of Toronto

### III HOW THE COURSE IS ORGANIZED

This course is organized by 2 hours a week lecture and 1.5 hours practice in the lab. Students are expected to attend lecture from 12 to 14pm in-person every week and choose either to attend the lab between 14 to 15:30 or 15:30 to 17pm. Attendance is compulsory.

Over the course of each week, students are expected to read, participate and submit the assignments according to the due dates and deadlines.

### COURSE SCHEDULE & RELEVANT SESSIONAL DATES:

The following course schedule is approximate and might have some changes after the two TAs are confirmed and after the pre-course survey and the first session.

Week/ Date	Subject, activity, assignment, etc.	Lab
<b>Week 1</b> Tue, Jan 7	Subject: Climate change and urban challenges Activity: In- class discussion about the current state of Toronto	Subject: Introduction to GIS and its applications
Fri, Jan10/ Submit on Quercus by 17pm	<b>Assignment 1:</b> identify an urban problem they like to work on. Write at least 5 reasons on the importance of the topic bringing evidence (references, statistics)	Activity: QGIS installation



<b>Week 5</b> Tue, Feb 4	Subject: Urban Food Production (Urban Agriculture) and green infrastructure	Subject and Activity: Georeferencing and overlaying maps with satellite photos
<b>Week 6</b> Tue, Feb 11  Fri, Feb 14 Submit on Quercus by 17pm	Subject: Sustainable waste management, Smart technologies, City of Toronto initiatives  <b>Assignment 3:</b> Part 1: Visualizing spatial statistics Part 2 : Raster GIS analysis  Activity: Finalizing project groups and team members	Activity: Introduction to Raster Math in GIS Visualize the location and quantity of flooding reports in Toronto, and relate the data to landcover type, urban density, and economic indicators
<b>Week 7</b> Tue, Feb 18	Reading Week, No class!	
<b>Week 8</b> Tue, Feb 25	<b>Mid-term exam</b> via Quercus in class. Course project discussion and paper writing corrections	Meeting with groups and team members, GIS questions
<b>Week 9</b> Tue, Mar 4  Fri, Mar 7 Submit on Quercus by 17pm	Subject: Sustainable transport and smart solutions to transit  <b>Assignment 4:</b> Raster GIS analysis	Activity: Visualize raster land surface temperature (LST) data for the Toronto area, and analyze its relationship to Toronto buildings and roads shapefiles.
<b>Week 10</b> Tue, Mar 11	Subject 1: Urban Energy Systems and Smart Grids  Subject 2: Smart infrastructure and its role to achieve urban sustainability	Activity: Using non-spatial data from the Toronto Open Data portal regarding energy consumption and sunlight.
<b>Week 11</b> Tue, Mar 18		

Fri, Mar 14 Submit on Quercus by 17pm	Subject: Sustainable buildings and sustainable construction  <b>Assignment 5:</b> Geometric-based GIS calculations	Activity Using distance-based measures in estimating urban quality. GIS tips and troubleshooting session.
<b>Week 12</b> Tue, Mar 25	Subject: Social urban sustainability, The Participatory City, participatory planning, Crowd-Sourcing, Open Data and City Dash Boards	<b>Final project presentation (group or individual),</b> Each topic 10mintues
Fri, Mar 28 Submit on Quercus by 17pm	<b>Final submissions:</b> Part1: submit the <b>group work presentation file</b> Part 2: submit the <b>individual report</b>	
Week 13 Tue, Apr 1	<b>Final exam</b> , in class	<b>Final project presentation, (group or individual), (if any left)</b>

### LABORATORY OBJECTIVES:

Laboratories are a part of our course, what you learn in the lab is what you need to present in your project. You should attend the lab every session and learn how to work with QGIS to help you analyze and prepare maps for your final project. The TA(s) in the laboratories help you to work with the software.

## IV EVALUATION/GRADING SCHEME

See the course schedule for homework assignment and midterm quiz timing. Assignments will be due on Fridays at 11:55 pm during the weeks indicated.

### MARK BREAKDOWN

Attendance and participation	10% of final marks
Homework assignments	20% of final marks
Midterm quiz	20% of final marks
Analysis project(GIS)	20% of final marks
Final Report	10% of final marks
Final quiz	20% of final marks

**Note:** if an unexpected technical issue occurs with a university system (e.g., Quercus services, network outage) that affects availability or functionality, it may be necessary to revise the timing or weighting of the assessments.

### CRITERIA FOR EVALUATING WORK

**The primary criteria used in evaluating reports are the following:**

- **Mechanics:** Your work must be completely free of grammatical errors, spelling errors or major factual errors. References should be in Harvard style and the same format must be used consistently and they must be accurate.
- **Plagiarism:** Similarity rate of more than 15% is not acceptable and the paper will lose the full mark. Make sure there is no copy-paste from references.
- **Writing style:** Your papers should be written in a clear and unambiguous style which assists, rather than impedes, communication with the reader.
- **Structure:** Your written work should have a clear focus, provided by the research question, and a structure which logically flows from that focus.
- **Precision and accuracy:** Precision means saying exactly and specifically what you mean, avoiding ambiguity and vague generalities. Accuracy refers to absence of major factual errors.
- **Analysis:** Your analysis should display understanding of the topic and, based on that understanding, originality of thought.

**The primary criteria used in evaluating oral presentations are the following:**

- **Success in communicating** key concepts succinctly and accurately, thereby demonstrating sound understanding of the work being presented.
- **Mechanics of communication**, such as manner of speaking (including good diction and tone), structure of the presentation and level of organization.
- **Ability to respond** appropriately and fairly to questions and contribute to and stimulate unstructured discussion among peers.

## **V COURSE POLICIES**

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- University statement regarding a positive learning environment: *“The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another’s differences. U of T does not condone discrimination or harassment against any persons or communities.”*
- I will respond to email within 24 hrs on weekdays
- All assignments are due at the specified time and date. Late submission will result in a 10% deduction (of each assignment’s total grade) per day.
- Attendance will be taken seriously and has a 10% share in your final mark. It is checked every session in lecture and in lab using a variety of methods from short Quercus quiz to in-class submissions.
- Students who for reasons beyond their control are unable to submit an assignment by its deadline must obtain approval from their instructor for an extension within the term.
- All assignment submissions will take place through Quercus. Plagiarism software will be used to check submitted reports and those with similarity rate more than 15% are not accepted and lose the mark.

- The use of generative artificial intelligence tools or apps for assignments in this course, including tools like ChatGPT and other AI writing or coding assistants, is prohibited.
- This course requires the use of computers, and of course sometimes things can go wrong when using them. You are responsible for ensuring that you maintain regular backup copies of your files, use antivirus software (if using your own computer), and schedule enough time when completing an assignment to allow for delays due to technical difficulties. Computer viruses, crashed hard drives, lost or corrupted files, incompatible file formats, and similar mishaps are common issues when using technology, and are not acceptable grounds for a deadline extension.

## VI TECHNOLOGY REQUIREMENTS

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Specific guidance from the U of T Vice-Provost, Students regarding student technology requirements is available here:

<https://www.vicereprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning/>

Advice for students more broadly regarding online learning is available here:

<https://onlinelearning.utoronto.ca/getting-ready-for-online/>

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## VII INSTITUTIONAL POLICIES AND SUPPORT

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### ACADEMIC INTEGRITY

#### **On Academic Integrity:**

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters

(<https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

- Using or possessing unauthorized aids.
- Looking at someone else's answers during an exam or test.
- Misrepresenting your identity.

In academic work:

- Falsifying institutional documents or grades.
- Falsifying or altering any documentation required by the University.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see <https://www.academicintegrity.utoronto.ca/>).

### **COPYRIGHT**

If a student wishes to copy or reproduce lecture presentations, course notes or other similar materials provided by instructors, he or she must obtain the instructor's written consent beforehand. Otherwise all such reproduction is an infringement of copyright and is absolutely prohibited. More information regarding this is available here: <https://teaching.utoronto.ca/ed-tech/audio-video/copyright-considerations/>

### **ACCESSIBILITY NEEDS**

Students with diverse learning styles and needs are welcome in this course. The University of Toronto is committed to accessibility: if you require accommodations for a disability, or have any other accessibility concerns about the course, please contact Accessibility Services as soon as possible.

### **ADDITIONAL SERVICES and SUPPORT**

The following are some important links to help you with academic and/or technical service and support

- General student services and resources at Student Life
- Full library service through University of Toronto Libraries
- Resources on conducting online research through University Libraries Research
- Resources on academic support from the Academic Success Centre
- Learner support at the Writing Centre
- Information for Technical Support/Quercus Support