ENV 307H **Urban Sustainability**
Winter 2024

I CONTACTS

INSTRUCTOR
Name: J. Alstan Jakubiec
Email: alstan.jakubiec@daniels.utoronto.ca
(use the subject line tag [ENV307] please)

TAs

Name:	William Ma	Noor Latif
Email:	willg.ma@mail.utoronto.ca	noor.latif@mail.utoronto.ca

II Course Overview

LOCATIONS:

We have access to a GIS lab (See Quercus homepage for details). You may also wish to familiarize yourself with the MDL's GIS lab. The software we will use this term (QGIS) will work on Windows and Mac (High Sierra, 10.13 and newer) computers and is free.

MEETING TIMES / LOCATIONS:

- Lecture (all students)
  Tuesdays, 1200 – 1400

- PRA0101 – GIS Session
  Tuesdays, 1400 – 1530

- PRA0202 – GIS Session
  Tuesdays, 1530 – 1700

OFFICE HOURS:

Alstan's Office Hours:
- Wednesdays 1300 – 1500
- Or by appointment

COURSE DESCRIPTION:
This seminar course provides a broad overview of methods for the design and analysis of sustainable urban neighbourhoods and cities. Subtopics within this field that students will learn about include: climate change & carbon emissions, walkability, water management, resource management, urban heat island and microclimate, growth and sprawl, energy production, and daylighting. The Urban Sustainability course will provide insight to these topics through theoretical discourse, case studies, and data-driven analyses of the weekly topics. Each week, approximately 1 hour and 20 minutes of the course will be dedicated to introductory analytical exercises using Geographic Information Systems (GIS) software making use of the extensive public Toronto GIS data available. This portion of the class will happen in the separate practical lab sessions (PRA0101 or PRA0201).

There are two homework assignments focused on applying the GIS software learned in class, a midterm and final quiz, and a group analysis project focused on analysing a specific course topic within Toronto. Final presentations will take place during class in Week 12 such that students can learn from the work of differing groups. Attendance will be taken weekly using a question response from the weekly reading, which is required.

STUDENT LEARNING OUTCOMES:
By the end of this course, a successful learner will be able to do the following:

1. Understand the impacts of urban areas on the environment, locally and globally.
2. Assess and discuss environmental concepts related to the design of urban areas.
3. Be able to describe and critique the sustainable aspects of an urban development based on objective data.
4. Analyze a subset of environmental issues based on measured data (in-class GIS activities and homework assignments).
5. Make recommendations towards sustainable urban development based upon novel analysis (group analysis project).

III HOW THE COURSE IS ORGANIZED

This course will be largely taught synchronously. The practical sessions (PRA0101/0201) will each have a short 30-minute asynchronous introduction video posted ahead of time, which you should watch prior to attending your assigned practical session. Readings will be assigned each week related to the content discussed that week and are to be read prior to the following week.

During synchronous lecture sessions the following will occur each week: (a) deliver a lecture, (b) discuss the weekly case study and readings, (c) answer student questions, and (d) facilitate discussion. During synchronous practical sessions, we will engage a weekly activity through a digital, ‘hands-on’ session in the CR325 computer lab. You should be prepared for this session by watching the asynchronous practical video ahead of time!

Participation in the course requires the submission of two homework activities, two quizzes, and a final analysis project. Attendance will be taken using a short Quercus quiz during each class period. If you are not able to attend a synchronous session due to illness or otherwise, please let me know as soon as possible.

Assignments will be due on Fridays at 11:55 pm during the weeks indicated.

WEEKLY COURSE SCHEDULE (1 – 4)

Date (Week)	Topic	Activities & Assignments
9 Jan (Week 1)	Introduction to urban sustainability Differing value systems for urban infrastructure Case Studies Masdar City Selected Reading Michael Sorkin: Traffic in Democracy	Activity Introduction to the QGIS geographic information system (GIS) tool
16 Jan (Week 2)	Urban energy use, carbon emissions, and climate change Case Studies BedZED London Selected Reading Mohsen Mostafavi: Excerpts from Ecological Urbanism	Activity Introduction to QGIS part 2: Key functions, mapmaking, and relational data Overview of the City of Toronto Open Data portal
23 Jan (Week 3)	Transportation and walkability Case Studies Masterplan of Milan Selected Reading Lawrence D. Frank: Land Use and Transportation Interaction – Implications on Public Health and Quality of Life	Activity Data normalization techniques, point data to density, and data overlays Assignment #1 – Visualizing spatial statistics (Out)
30 Jan (Week 4)	Water management Urban greenery Case Studies Ang Mo Kio-Bishan Park Selected Reading Singapore PUB: Active, Beautiful, Clean Waterways Selected Case Studies Zhang, et al.: Conventional and Decentralized Urban Stormwater Management: A Comparison Through Case Studies of Singapore and Berlin, Germany	Activity GIS review and Q&A session

WEEKLY COURSE SCHEDULE (5 – 8)

Date (Week)	Topic	Activities & Assignments
6 Feb (Week 5)	Urban resource utilization Urban metabolism <u>Case Studies</u> Toronto <u>Selected Reading</u> Paulo Ferrão and John Fernandez: Urban Metabolism: Resource Consumption of Cities	<u>Activity</u> Introduction to Raster Math in GIS Visualize the topography of a Toronto neighborhood and compare it to landcover type to assess drainage and flood risk <u>Assignment</u> #1 – Visualizing spatial statistics (Due) #2 – Raster GIS analysis (Out)
13 Feb (Week 6)	Urban microclimate and public space Urban heat island <u>Case Studies</u> Hong Kong, Tokyo, Tucson, Chicago, New York Selected Reading (None this week.)	<u>Activity</u> Visualize raster land surface temperature (LST) data for the Toronto area, and analyze its relationship to Toronto buildings and roads shapefiles.
20 Feb	Reading Week, no class.	
27 Feb (Week 7)	Midterm quiz Course project discussion	<u>Activity</u> Formation of analysis project groups.
5 Mar (Week 8)	Urban growth and sprawl <u>Case Studies</u> Atlanta <u>Selected Reading</u> Bruegmann: Excerpts from Sprawl, a Compact History	<u>Activity</u> Meeting with project groups

WEEKLY COURSE SCHEDULE (9 – 12)

Date (Week)	Topic	Activities & Assignments
12 Mar (Week 9)	Urban energy and food production Case Studies Cambridge, MA, USA Selected Reading Carlisle and Bush: Moving to Renewable Communities	Activity Calculating sunlight hours—a simple indicator of environmental performance. Using non-spatial data from the Toronto Open Data portal. Assignment #2 – Raster GIS analysis (Due)
19 Mar (Week 10)	Urban daylighting and ventilation Case Studies (None this week) Selected Reading Andersen and Sattrup: The Urban Canyon and Building Energy Use-Urban Density Versus Daylight and Passive Solar Gains	Activity Using distance-based measures in estimating urban quality. GIS tips and troubleshooting session. Assignment Analysis project part A – Meet either this week or next with Alstan or a TA to discuss your project analysis with at least one map available in draft form.
26 Mar (Week 11)	Measures of urban form towards design metrics Case Studies Toronto Selected Reading (None this week)	Activity Meeting with project groups Assignment Analysis project part A – Meet this week if you have not done so with Alstan or a TA to discuss your project analysis with at least one map available in draft form.
2 Apr (Week 12)	Analysis project presentations in 3(+), 1-hour sessions	
	Final quiz to be scheduled (via Quercus).	

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.

The final quiz will be scheduled by FAS.

MARK BREAKDOWN

Attendance and participation	10% of final marks
Homework assignments	20% of final marks
Midterm quiz	20% of final marks
Analysis project	30% 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 assignments and the analysis project will be disseminated during the course on a per-assignment basis.

V COURSE POLICIES

- This statement from the university is of utmost importance: "*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 e-mail inquiries within 24 hours on weekdays. I appreciate it if you prepend a tag [ENV307] to the e-mail subject line when writing me about the course. Contact through Quercus is also fine but less preferable.
- Students must watch available recorded practical content on their own time prior to attending synchronous sessions.
- 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 using a short Quercus quiz during each class period. If you are not able to attend a synchronous session due to illness or otherwise, please fill out the self-declaration form on ACORN (if appropriate) and let me know as soon as possible. We will not be requiring verification of illness this term.
- 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.
- 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.

VI TECHNOLOGY REQUIREMENTS

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

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.

VII INSTITUTIONAL POLICIES AND SUPPORT

ACADEMIC INTEGRITY

On Academic Integrity:
The University of Toronto treats cases of academic misconduct very seriously. Academic integrity is a fundamental value of learning and scholarship at the U of T. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that your U of T degree is valued and respected as a true signifier of your individual academic achievement.

The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic misconduct, the processes for addressing academic offences, and the penalties that may be imposed. You are expected to be familiar with the contents of this document. 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 (this includes working in groups on assignments that are supposed to be individual work).

On tests and exams:

- Using or possessing any unauthorized aid, including a cell phone.
- Looking at someone else's answers.
- Letting someone else look at your answers.
- Misrepresenting your identity.
- Submitting an altered test for re-grading.

Misrepresentation:

- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.
- Falsifying institutional documents or grades.

All suspected cases of academic dishonesty will be investigated following the procedures outlined in the *Code of Behaviour on Academic Matters*. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me. If you have questions about appropriate research and citation methods, you are expected to seek out additional information from me or other available campus resources like the College Writing Centres, the Academic Success Centre, or the U of T Writing Website.

COPYRIGHT

All lecture materials will be posted online through Quercus (recordings of lectures, copies of lecture slides, recorded synchronous meeting sessions, and lecture notes). If a student wishes to copy or reproduce any of this material for their own use, that is fine. Reproduction of course content online outside of Quercus is an infringement of copyright and is absolutely prohibited.

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