

Course Syllabus

 Edit

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[†]Please review **Communication policy** below before contacting the teaching team.

This course is designed to be as interactive as possible. My role as an instructor is to introduce you to theories, principles, and tools for data visualization, which will be covered in the readings and the video lectures. Your role in the course is to study these materials independently and to actively engage in the in-class activities. Many concepts may seem relatively easy to comprehend when passively listening to a seminar course, but in practice, most of these concepts are not trivial to apply. We designed the in-class activities for you to experiment, inquire, and make mistakes in a safe environment. Through this process, you will learn by doing. Take advantage of these activities before formal assessments to succeed in the course.

Course description & learning objectives

This course is all about data visualization - the art and science of turning data into readable graphics and charts. You will learn the science behind effective visual communication of data. You will learn to evaluate the effectiveness of visualization designs by critically thinking about each design decision such as choice of visual encodings and choice of colour. You will critique existing visualizations. You will also explore how to design and create data visualizations based on data available and tasks to be achieved. This process includes the understanding and application of methods and principles of data and task abstraction, mapping data attributes to graphical attributes, and strategic visual encoding. You will demonstrate all your skills through creating your own visualizations using modern data visualization tools individually and in groups. This course has no midterm nor final exam. You will earn your course grades with online quizzes, individual and group assignments, and a final project.

This course is designed to provide you with the foundations necessary for evaluating and creating visual representations of data. The *learning objectives* are:

1. to understand the principles of designing and creating effective data visualizations;
2. to evaluate, critique, and improve upon one's own and others' data visualizations based on how good a job the visualization applies principles for effective communication;
3. to correctly use key techniques and theory used in data visualization science including data models, graphical perception, and techniques for visual encoding and interaction;

4. to brainstorm, sketch, and design prototypes that solve real user problems;
 5. to use R and a variety of modern visualization packages and tools to create data visualizations;
and
 6. to work effectively individually and collaboratively.
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Delivery format

The format of this course is "flipped". In a flipped classroom, you are introduced to the content at home before class time. Then you come prepared to class for interactive hands-on activities, practice, and scenario-based experiences that reinforce this content. In this flipped classroom, **you** are an integral, active part in the face-to-face instruction. You will bring ideas, discussion points, and questions to the classroom. Through hands-on activities, you will apply the concepts you learned at home by watching video lectures, readings, and other supplementary materials. These activities will provide opportunities to seek face-to-face feedback from the teaching team.

Before coming to class, you will study the topics to be covered in the week's lesson by:

- watching short lecture videos;
- reading mandatory readings;
- identifying points you don't understand and questions you have from the readings and lecture videos; and
- thinking critically about the lesson's content through application exercises.

During class, you will consolidate learning with the instructor and classmates by:

- practicing through ungraded individual and group activities; and
- bringing ideas, engaging in discussions, and asking questions.

We will also run *tutorials/practicals*, where you will deepen your learning by:

- practicing fundamental and technical skills on various use cases; and
- consulting with other students and instructors on your own work.

To make fully engage, bring your laptops to the tutorials/practicals.

Class times and locations

Section Lec0101

- Lecture: Monday, 10:00 am to noon in [AH400 \(https://map.utoronto.ca/?id=1809#!m/494578?share\)](https://map.utoronto.ca/?id=1809#!m/494578?share)
- Tutorials / Practicals: Friday, 10:00 am to 11:00 am in [AH400 \(https://map.utoronto.ca/?id=1809#!m/494578?share\)](https://map.utoronto.ca/?id=1809#!m/494578?share) (AH100 only on September 27)

Section Lec0201

- Lecture: Monday, 03:00 pm to 05:00 pm in [VC323 \(https://map.utoronto.ca/?id=1809#!m/494602?share\)](https://map.utoronto.ca/?id=1809#!m/494602?share)
- Tutorials / Practicals: Friday, 02:00 pm to 03:00 pm in [MS2172 \(https://map.utoronto.ca/?id=1809#!m/494491?share\)](https://map.utoronto.ca/?id=1809#!m/494491?share)

Prerequisites

CSC108H1 / CSC1101Y1 / CSC120H1 / CSC148H1; STA238H1 / STA248H1 / STA261H1 / ECO227Y1

Knowledge/experience in the following areas is an asset though no background is required: graphic design/image manipulation; technical writing; development; psychology or human cognition.

Evaluation

You will be evaluated according to the [University Assessment and Grading Practice Policy \(https://governingcouncil.utoronto.ca/secretariat/policies/grading-practices-policy-university-assessment-and-january-1-2020\)](https://governingcouncil.utoronto.ca/secretariat/policies/grading-practices-policy-university-assessment-and-january-1-2020). The table below shows the weight of each assessment.

Assessment	Weight	Due
Quizzes	10%	(Sept 26; Oct 17; Nov 14; Nov 28)
Assignments	40%	
• Assignment 1	10%	October 8
• Assignment 2	15%	November 12
• Assignment 3	15%	December 2
Project	45%	
• Project pitch	5%	November 4
• Project mock-up	10%	November 19
• Project product	15%	December 2
• Project demo video	15%	December 2
Participation	5%	(throughout the term)

Assessment	Weight	Due
<ul style="list-style-type: none"> • Quizzes: Due roughly every three weeks, you will complete them individually on Quercus. Lowest quiz score will be dropped. • Assignments: You will complete the assignments individually (A1, A3) or in a pair (A2). The assignments are designed to assess your knowledge and understanding of the theoretical and technical content covered in the lessons through application exercises. • Project: You will complete a final term project in a group of 5 to 6 members. The project is designed to be open-ended, giving you an opportunity to define the topic and realize a visualization product of your choice within constraints. The project deliverables act as important milestones guiding your process - from the project pitch early in the process, to capturing and refining ideas as mock-ups, to the implementation and realization of the final product. You will also prepare a demo video featuring your final product and documenting the creation process. • Participation: Assessed throughout the semester, using a variety of methods and tools. Class attendance in lecture and tutorial/practical is a firm expectation; frequent absences or tardiness will be considered a legitimate cause for participation grade reduction. Participation to activities is a firm expectation; missing activities or lack of engagement in activities will also be considered a legitimate cause for participation grade reduction. Other activities that may contribute to the participation grade include formal submission of visualizations for class discussion and thoughtful answers to student questions on Piazza. Any actions that violate the our community agreement may result in partial to full participation grade reduction. 		

Accessibility, diversity, and inclusiveness

I aim to create a learning environment where students from all diverse backgrounds and perspectives are well-served, and the diversity brought by the students to this class is viewed as a resource, strength, and benefit.

If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the beginning of the academic year by visiting

<https://studentlife.utoronto.ca/department/accessibility-services/>

[\(https://studentlife.utoronto.ca/department/accessibility-services/\)](https://studentlife.utoronto.ca/department/accessibility-services/). This will allow AS to assess your situation, develop an accommodation plan with you, and support you and the teaching team in applying adequate accommodations by issuing a [Letter of Accommodation](#)

[\(https://studentlife.utoronto.ca/service/letter-of-accommodation/\)](https://studentlife.utoronto.ca/service/letter-of-accommodation/). Remember that the process of accommodation is private: AS will not share details of your needs or condition with the teaching team, and similarly, the teaching team will not reveal that you are registered with AS. This formal process is necessary, as the teaching team is not equipped to evaluate your personal situation. Without registration, you will not be able to verify your situation with us, and we will not be advised about your accommodation needs. Note that it is your responsibility to forward your letter to the instructor and request for accommodations timely as indicated in the letter.

♥ [Register with Accessibility Services \(https://studentlife.utoronto.ca/service/accessibility-services-registration-and-documentation-requirements/\)](https://studentlife.utoronto.ca/service/accessibility-services-registration-and-documentation-requirements/)

It is my intent to present materials and activities that are respectful of diversity in gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. I encourage you to provide suggestions and let me know ways to improve the effectiveness and inclusiveness of the course using the anonymous feedback form below. Your suggestions may include feedback on materials presented in the course by the teaching team or something that was said in class by the teaching team or fellow students that made you feel uncomfortable. I appreciate such feedback as I learn about diverse perspectives and identities of the students

♥ [Provide anonymous feedback on the course](https://forms.office.com/r/2Vkz3bgdR) ↗ (https://forms.office.com/r/2Vkz3bgdR)

Course policies

Accommodations for missed or late submissions

You may request for accommodations for missed or late submissions of Assignments and Project deliverables as described below. There will be no exceptions for the quizzes and any late quiz submissions will not be graded. You must submit the requests within **1 week** following the deadline of the assessment. Any late requests may be rejected without a notice.

Disability-related accommodations for assessments

If you are experiencing difficulties that affect your learning due to a disability or if you believe that you may have a disability, we encourage you to register with the University of Toronto's [Accessibility Services](https://studentlife.utoronto.ca/department/%20accessibility-services/) (AS) and have them issue a [Letter of Accommodation](https://studentlife.utoronto.ca/service/letter-of-accommodation/) as described in the section *Accessibility, diversity, inclusiveness*. You can then attach the Letter of Accommodation with *each* accommodation request using the form below. You must submit the request within **1 week** following the deadline of the assessment.

✍ [Accommodation request form](https://forms.office.com/r/ZuDxXssJur) ↗ (https://forms.office.com/r/ZuDxXssJur)

Non-disability-related accommodations for assessments

If you face unforeseen exceptional circumstances including medical, personal, family, or other unavoidable reasons and miss the deadline for the Quizzes, Assignments, or Project deliverables, you must submit an accommodation request using the form below. All request must contain one of the following documents:

- Absence Declaration form via [ACORN](https://acorn.utoronto.ca/) in PDF. Use "Print Absences" button to obtain a PDF copy and do not use a screenshot. Note that you may submit the Absence Declaration form only once per term.
- [U of T Verification of Illness or Injury Form \(VOI\)](https://registrar.utoronto.ca/policies-and-guidelines/verification-of-illness-or-injury/) completed by licensed practitioners in Canada. See

[University Registrar's Office's page \(https://registrar.utoronto.ca/policies-and-guidelines/verification-of-illness-or-injury/\)](https://registrar.utoronto.ca/policies-and-guidelines/verification-of-illness-or-injury/) for details.

- A letter from your College Registrar. Your College Registrar can often provide guidance on unforeseen circumstances and will provide a letter requesting accommodations for assessments if needed.

After obtaining the document, you must submit the accommodation request with the document attached using the form below within **1 week** following the deadline of the assessment.

 [Accommodation request form](https://forms.office.com/r/ZuDxXssJur)  (https://forms.office.com/r/ZuDxXssJur)

For group assessments - Assignment 2 and Project, it is important to coordinate your efforts. Please advise your group member(s) before submitting any accommodation request. You do NOT have to reveal personal details; however, let your group member(s) know how your current situation will impact your availability. All accommodation requests will be considered for the whole group.

Late penalty

All assessments are to be submitted by midnight in Toronto time on the due date.



- Late Quizzes are not accepted without any make-up. The lowest quiz grade will be dropped regardless of submission status.
- For Assignments, Project deliverables except the Project pitch, non-accommodated late submissions will incur a penalty as below:
 - Submissions < 24 hours late will lose 10% of the earned grade.
 - Submissions < 48 hours late will lose 30% of the earned grade.
 - Submissions more than 48 hours late will receive no credit and you will not receive written feedback.
- All project pitch presentations will take place on a single day and at least one member of each must be present in person to receive a grade. All groups who fail to present on the day will receive a grade of 0.

Should you miss the project pitch presentation or miss the 48 hour late submission period for the project mock-up, it is your group's responsibility to seek in-person feedback from the teaching team during office hours or consultation appointments.

Marking concerns



There will be no regrading for quizzes. For Assignments and Project deliverables, you must submit a regrading request within **1 week** of the graded work being returned. All regrading requests must be submitted using the form below and must include a written justification for consideration. Any regrading request submitted beyond the 1-week period or not using the form will be ignored without a notice. For

group assessments, please submit only one request per group per assessment. Any duplicate request will be ignored. Keep in mind that it is possible for your assessment grade to go down if the regraded mark is lower.

 [Submit a regrading request](https://forms.office.com/r/xzu1bfjP6t)  (https://forms.office.com/r/xzu1bfjP6t)

Getting help

You will have the option to use Piazza for class discussion. If you decide not to use Piazza, it will not be disadvantageous to you in any way, and will not affect official University outcomes. If you choose not to use Piazza, you can ask questions or discuss course materials with the instructor or teaching assistants during office hours.

Be sure to read Piazza's Privacy Policy at <https://piazza.com/legal/privacy>  (<https://piazza.com/legal/privacy>) and Terms of Use at <https://piazza.com/legal/terms>  (<https://piazza.com/legal/terms>) carefully. Take time to understand and be comfortable with what they say. They provide permissions for substantial sharing and disclosure of your personal information held by Piazza, which affect your privacy. If you decide to participate in Piazza, only provide content that you are comfortable sharing under the terms of the Privacy Policy and Terms of Use.

Note that the teaching team will leave room for each of you to actively contribute to the Piazza forum. We will wait **at least 24 business hours** before answering questions on Piazza. We encourage you to engage in active and respectful discussions.

 [Visit Piazza](https://piazza.com/utoronto.ca/fall2024/sta313h1f)  (https://piazza.com/utoronto.ca/fall2024/sta313h1f)

The course instructor will hold regular office hours between 12:30 pm to 1:30 pm & 5:30 pm to 6:30 pm on Mondays after each lecture. The office hours will take place in person in [UY9167](https://map.utoronto.ca/?id=1809#!m/497527?share) (<https://map.utoronto.ca/?id=1809#!m/497527?share>). Additional office hours and consultation appointments will be available.

Communication policy

Questions about course content or organization such as

- Is it appropriate to use this analysis or visualization method?
- What library would you recommend for visualizing maps?
- What is the due date?

can be posted on the course Piazza. You have the option to post privately to the teaching team or anonymously to classmates; all posts are NOT anonymous to the teaching team. You can also visit us during office hours for questions on content

For accommodation requests and regarding requests, you must use the corresponding forms as described in sections *Accommodations for missed or late submissions* and *Marking concerns*

respectively.

In other cases where you want to contact privately with the teaching team, you are welcome to send an email to the course email.

- Always use the course email at sta313@course.utoronto.ca (<mailto:sta313@course.utoronto.ca>) to ensure that your message reached the teaching team.
- Always use your UofT email address ending with `utoronto.ca`.
- Always include your full name and UTORid in your email.

Emails that do not meet the above requirements (e.g., emails sent to the instructor's personal email address, emails sent from Gmail, Quercus messages) will be ignored without a notice.

 [Contact us via email \(mailto:sta313@course.utoronto.ca\)](mailto:sta313@course.utoronto.ca)

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 university. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that your degree is valued and respected.

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 misconduct, the processes for addressing academic offenses, and the penalties that may be imposed. You are expected to be familiar with the contents of this document.

As a general rule, we encourage you to discuss course contents with each other and ask others for advice. However, it is not permitted to share complete solutions or directly share code for any graded assessments. For Assignment 2 and project deliverables, you are welcome to share solutions and code to collaborate with other members of your team. However, you must not share solutions or code with another team. For example, you may ask "What R function did you use for question XX?"; you may NOT ask "please show me your R code for question XX."

You are also NOT allowed to seek unauthorized aid for any of the graded assessments outside the class. That is, you are not allowed to get help from private tutors, former students, or anyone who is not the course instructor or the teaching team when completing graded assessments including the Quizzes, Assignments, and Project.

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 the teaching team.

Photographs, audio & video recordings, and copyright

Reproduction and/or sharing of course materials is prohibited. Course materials include lecture slides, video recordings, course notes, assessments, data and documents provided by the instructors. All such reproduction or dissemination is an infringement of copyright and is prohibited. Tape-recording, photographing, screen capturing, video-recording or otherwise reproducing lecture presentations, course notes or other similar materials provided by instructors is also prohibited. See the [University of Toronto Academic Integrity's note on recording lectures \(https://www.academicintegrity.utoronto.ca/smart-strategies/recording-lectures/\)](https://www.academicintegrity.utoronto.ca/smart-strategies/recording-lectures/).

Your responsibilities

Engage in the course material

The course is designed to actively engage you in the course material. We hope you will find the science of visualization interesting, challenging, and fun. In order for classroom sessions and tutorials to be effective, prepare by learning about the week's lesson through completing the mandatory lecture videos and readings, and engage in the activities during synchronous class.

Announcements and resources

Lectures videos and slides, readings, and assessments will be posted on Quercus. It is your responsibility to check the Quercus course website regularly for updates. Announcements will be posted on Quercus & sent as emails through Quercus (provided that you configured your Quercus to receive an email notification when announcements are posted). It is your responsibility to check Quercus & your email regularly for incidental communication and updates about the course.