

STA130H1 F

An Introduction to Statistical Reasoning and Data Science

Fall 2024 Syllabus

Course Meetings

STA130H1 F

Section	Day & Time	Delivery Mode & Location
LEC0101	Monday, 9:00 AM - 11:00 AM	In Person: NF 003
LEC0201	Monday, 1:00 PM - 3:00 PM	In Person: MC 102
TUT0101	Friday, 9:00 AM - 11:00 AM	In Person: AB 114
TUT0102	Friday, 9:00 AM - 11:00 AM	In Person: PB 255
TUT0103	Friday, 9:00 AM - 11:00 AM	In Person: HA 410
TUT0104	Friday, 9:00 AM - 11:00 AM	In Person: HS 108
TUT0105	Friday, 9:00 AM - 11:00 AM	In Person: HA 401
TUT0106	Friday, 9:00 AM - 11:00 AM	In Person: UC 175
TUT0107	Friday, 9:00 AM - 11:00 AM	In Person: UC 261
TUT0108	Friday, 9:00 AM - 11:00 AM	In Person: BL 113
TUT0109	Friday, 9:00 AM - 11:00 AM	In Person: WI 523
TUT0110	Friday, 9:00 AM - 11:00 AM	In Person: SS 581
TUT0111	Friday, 9:00 AM - 11:00 AM	In Person: UC 177
TUT0112	Friday, 9:00 AM - 11:00 AM	In Person: NF 235
TUT0201	Friday, 2:00 PM - 4:00 PM	In Person: PB 255
TUT0202	Friday, 2:00 PM - 4:00 PM	In Person: HA 401
TUT0203	Friday, 2:00 PM - 4:00 PM	In Person: HS 108
TUT0204	Friday, 2:00 PM - 4:00 PM	In Person: HA 410
TUT0205	Friday, 2:00 PM - 4:00 PM	In Person: HS 100
TUT0206	Friday, 2:00 PM - 4:00 PM	In Person: UC 67
TUT0207	Friday, 2:00 PM - 4:00 PM	In Person: MP 118
TUT0208	Friday, 2:00 PM - 4:00 PM	In Person: WI 523
TUT0209	Friday, 2:00 PM - 4:00 PM	In Person: RL 14190

Section	Day & Time	Delivery Mode & Location
TUT0210	Friday, 2:00 PM - 4:00 PM	In Person: WE 75
TUT0211	Friday, 2:00 PM - 4:00 PM	In Person: UC 175
TUT0212	Friday, 2:00 PM - 4:00 PM	In Person: SS 2111

Refer to ACORN for the most up-to-date information about the location of the course meetings.

Tutorials start on the FIRST week on Friday, September 6th, BEFORE the first lecture on Monday, September 9th.

While the course homepage is located on Quercus, additional code-related material of the course will be accessible through <https://github.com/pointOfive/stat130chat130/>

Course Contacts

Course Website: <https://q.utoronto.ca/courses/354091/>

Instructor: Assistant Prof., Teaching Stream Scott Schwartz

Email: sta130@course.utoronto.ca

Office Hours and Location: 1. [Expected] TA online OH (zoom link TBA): 4 TAs, Tuesday, 4-6PM ET 2. [Expected] TA in-person OH (SS 2112): 4 TAs, Wednesday, 4-6PM ET 3. [Expected] Prof Hybrid OH (DoSS [9th floor 700 University] 9195/9199, zoom link TBA): Thursday, 4-6PM ET

Additional Notes: Course Piazza discussion board (<https://piazza.com/utoronto.ca/fall2024/sta130>) monitored from 12-1PM ET and 5-6PM ET on Tuesday and Wednesday, and 12-1PM ET on Thursday. The course email sta130@utoronto.ca is monitored Mondays between and after LEC 11AM-1PM and 3-5PM ET.

Course Overview

STA130 course provides training in understanding and applying statistical and data science methodologies using python and includes a real-world course project which students can use to begin pursuing research. The course provides a custom online textbook which is searchable through a custom AI chatbot interface and encourages the use of your preferred AI chatbots (such as Microsoft Copilot or ChatGPT) to support learning and task-completion. ??????

Course Learning Outcomes

1. Describe how statistical methods can be used to learn from data, including methods for description, explanation, and prediction.
2. Conduct data cleaning and data wrangling in a reproducible manner to ensure reproducible analyses.
3. Carry out a variety of statistical analyses in python and interpret the results of the analyses.
4. Identify appropriate uses of statistical methods to answer questions, including their strengths and limitations.
5. Clearly communicate the results of a data analysis to both technical and non-technical

audiences.

6. Critically Evaluate Ethical Issues in Statistics and Data Science.

Prerequisites: None

Corequisites: None

Exclusions: None

Recommended Preparation: None

Credit Value: None

Course Materials

All technology and other resources used in the course are free:

- UofT JupyterHub: <https://jupyter.utoronto.ca>
- Piazza Discussion Board: <https://piazza.com/utoronto.ca/fall2024/sta130>
- STA130 online textbook: <https://github.com/pointOfive/stat130chat130/wiki>
- GitHub: <https://github.com> and <https://github.com/pointOfive/stat130chat130>
- UofT DCS MarkUs: <https://markus.teach.cs.toronto.edu/markus>
- Microsoft Copilot: <https://copilot.microsoft.com>
- (Optional) OpenAI ChatGPT: <https://chat.openai.com>
- (Optional) Google NotebookLM: <https://notebooklm.google> (experimental STA130 custom chatbot)

Please see <https://carte.utoronto.ca/cloud-resources/> for additional technology resources available to UofT students.

Marking Scheme

Assessment	Percent	Details	Due Date
Midterm Exam	22%	Currently expected to take place during normally scheduled Friday tutorial periods, but final scheduling TBA.	2024-10-18
Course Project Individual Proposals	2%	Due immediately upon return from READING WEEK.	2024-11-04
Course Project Practice Presentations and Individual Contribution Evaluation	2%	Takes place during Friday tutorial.	2024-11-29
Course Project Group Slides	8%		2024-12-02

Assessment	Percent	Details	Due Date
Course Project Orientation Recording	2%		2024-12-02
Course Project Individual Q&A Assessment	2%	Course Project Poster Fair takes place during the Thanksgiving holiday makeup class period.	2024-12-02
Individual Poster Fair Project Critiques and Reflection	2%	This is due the day after the Course Project Poster Fair (which is scheduled during Thanksgiving holiday makeup class period).	2024-12-02
Tutorial Attendance/Participation	11%	Each Tutorial Attendance/Participation is worth 1 point.	2024-09-06,2024-09-13,2024-09-20,2024-09-27,2024-10-04,2024-10-11,2024-10-25,2024-11-08,2024-11-15,2024-11-22,2024-11-29
HW	8%		2024-09-12,2024-09-19,2024-09-26,2024-10-03,2024-10-10,2024-11-07,2024-11-14,2024-11-21
Lecture Easter Egg Quiz	3%	The last of class of the year takes place on December, 2nd.	2024-09-09,2024-09-16,2024-09-23,2024-09-30,2024-10-07,2024-10-21,2024-11-04,2024-11-11,2024-11-18,2024-11-25,2024-12-01
Mentorship Program	3%	This entails three separate assignments each worth 1 point with all being due by Tuesday December, 3rd.	2024-12-02
Course Study Surveys	2%	There are two Pre- and two Post-Course Study Surveys. Pre-Course Study Surveys must be completed within the first three weeks of the semester, while Post-Course Study Surveys should be completed by the end of the semester, but will be accepted until the day of the final exam. Each of the (four) surveys is worth 0.5% (for the total of 2%).	2024-09-27,2024-12-01

Assessment	Percent	Details	Due Date
In-Person Final Exam	33%		Final Exam Period

Late Assessment Submissions Policy

- All "on time" assignments must be submitted through Quercus. - All assignments submitted after due dates must use the "Remarks/Late Submissions" form available on Quercus - "Late" submission penalties will be waived for up to two (2) assignments provided students submit ACORN absence declaration or Verification of Illness (VoI) forms through the "Remarks/Late Submissions" form available on Quercus - Course project Group Slides and Recordings will be accepted late until Fri Dec06 for a 5 point mark deduction after their due date of Mon Nov02 (the day before the Project Poster Fair) - Individual Proposals will be accepted late for a 0.5 point mark deduction until Fri Nov08 after their due date of Mon Nov04 (immediately upon return from Reading Week) - Marks for Individual Contributions will be assessed and assigned during Practice Presentations on Tues Nov29 and thus require student attendance - Marks for Individual Q&A Performance will be assessed and assigned during the Poster Project Fair Tue Dec03 and thus require student attendance - Marks for the Individual Poster Fair Project Critiques and Reflection require student attendance at the Poster Project Fair and will be accepted late for a 1 point mark deduction until Fri Dec06 after their due date of Wed Dec04 (the day after the Poster Project Fair) - TUT attendance in your enrolled TUT is mandatory for participation credit - Students can receive participation credit for up to two (2) missed TUT sessions by (a) submitting ACORN absence declaration or Verification of Illness (VoI) forms, and (b) going through the material in the missed TUT notebook themselves, and demonstrating completion and understanding on the basis of submitted ChatBot conversation sessions transcript logs - Up to two (2) HW assignments may be submitted for up to one week after their due date with a 0.5 point mark deduction

Course Schedule

Please see <https://github.com/pointOfive/stat130chat130> for additional details.

Standard Weekly Structure

1. Fri TUT (9AM or 2PM ET)
2. Mon LEC (9AM or 1PM ET)
 1. Tues TA online OH with 4 TAs (4-6PM ET)
Piazza monitored 12-1PM ET and 5-6PM ET
 2. Wed TA in-person OH (in SS 2112) with 4 TAs (4-6PM ET)
Piazza monitored 12-1PM ET and 5-6PM ET
 3. Thur Prof Hybrid (DoSS [700 University, 9th floor] 9195/9199) OH (4-6PM ET)
Piazza monitored 12-1PM ET
3. Thur HW (due midnight 12AM ET)

Fri TUT, Mon LEC, Thurs HW (Week 01 - Week 05)

- Week 01: Sep06, Sep09, Sep12 (Data Summarization)
- Week 02: Sep13, Sep16, Sep19 (Coding)
- Week 03: Sep20, Sep23, Sep26 (Visualization)
- Week 04: Sep27, Sep30, Oct03 (Bootstrapping)
- Week 05: Oct04, Oct07, Oct10 ("One Sample" Hypothesis Tests)

Midterm Week 06 Structure

- Fri Oct11 (Review)
- Mon Oct14 (Thanksgiving Holiday)
- Fri Oct18 (Midterm)

Reading Week 08 and "Week" 07+09 Structure

- Mon LEC Oct21 (Simple Linear Regression)
- Fri TUT Oct25 (Coefficient Hypothesis Testing)
- Mon Oct28 through Fri Nov01 (Reading Week)
- Mon LEC Nov04 (Two Sample Hypothesis Tests)
- Mon Nov04 (Individual Project Proposals due)
- Thur Nov07 (HW 06 due)

Fri TUT, Mon LEC, Thurs HW (Week 10 - Week 11)

- Week 10: Nov08, Nov11, Nov14 (Multiple Linear Regression)
- Week 11: Nov15, Nov18, Nov21 (Decision Tree Classification)

End of Semester and Project Week Structure (Week 12 - Week 13)

- Fri Nov22 and Mon Nov25 (Classification Ethics)
- Fri Nov29 (Practice Presentations)
- Mon Dec02 (Review)
- Mon Dec02 (Project Slides and Recording Due)
- Tue Dec03 (Project Poster Fair)

Policies & Statements

Late/Missed Assignments

Missed Assignments, Absences, and Late Enrollment

- All "on time" assignments must be submitted through Quercus.
 - All assignments submitted after due dates must use the "Remarks/Late Submissions" form available on Quercus
 - "Late" submission penalties will be waived for up to two (2) assignments provided students submit ACORN absence declaration or Verification of Illness (VoI) forms through the "Remarks/Late Submissions" form available on Quercus

Exams

- If you are not able to write your final exam at the scheduled time or if you miss a final exam for reasons outside your control, you may submit a deferred exam petition, which is a request to write your exam at a later time (as addressed at <https://www.artsci.utoronto.ca/current/faculty-registrar/petitions/deferred-exams>)
- The 22 points of a missed (2hr) midterm will transfer to the 33 points of the (3hr) final exam (provided students submit ACORN absence declaration or Verification of Illness (Vol) forms through the "Remarks/Late Submissions" form), making the final exam worth 55 points for students who miss the midterm exam (for legitimate reasons)

Course Project

- Course project Group Slides and Recordings will be accepted late until Fri Dec06 for a 5 point mark deduction after their due date of Mon Nov02 (the day before the Project Poster Fair)
- Individual Proposals will be accepted late for a 0.5 point mark deduction until Fri Nov08 after their due date of Mon Nov04 (immediately upon return from Reading Week)
- Marks for Individual Contributions will be assessed and assigned during Practice Presentations on Tues Nov29 and thus require student attendance
- Marks for Individual Q&A Performance will be assessed and assigned during the Poster Project Fair Tue Dec03 and thus require student attendance
- Marks for the Individual Poster Fair Project Critiques and Reflection require student attendance at the Poster Project Fair and will be accepted late for a 1 point mark deduction until Fri Dec06 after their due date of Wed Dec04 (the day after the Poster Project Fair)

Tutorials and HW

- TUT attendance in your enrolled TUT is mandatory for participation credit
 - Students who miss Sep06 Week 01 TUT due to late enrolment can receive participation credit by going through the material in the missed TUT notebook themselves, and demonstrating completion and understanding on the basis of submitted ChatBot conversation sessions transcript logs (due by Sep20)
 - Students can receive participation credit for up to two (2) missed TUT sessions by (a) submitting ACORN absence declaration or Verification of Illness (Vol) forms, and (b) going through the material in the missed TUT notebook themselves, and demonstrating completion and understanding on the basis of submitted ChatBot conversation sessions transcript logs
 - If your TA does not appear in TUT the full TUT must relocate to TUT103-105 or TUT202-204 for "attendance credit" (with each room able to accommodate one additional TUT section)
- Up to two (2) HW assignments may be submitted for up to one week after their due date with a 0.5 point mark deduction
 - Students who do not submit Week 01 HW (due Sep12) due to late enrolment may submit Week 01 HW by Sep19 without penalty

Other

- No mentorship submissions will be accepted after Tue Dec03
- Pre-course study surveys will be accepted during the first three weeks of class
- Post-course study surveys will be accepted until the day of the final exam

Assignment Submission Method

- All "on time" assignments must be submitted through Quercus.
 - All assignments submitted after due dates must use the "Remarks/Late Submissions" form available on Quercus
 - "Late" submission penalties will be waived for up to two (2) assignments provided students submit ACORN absence declaration or Verification of Illness (VoI) forms through the "Remarks/Late Submissions" form available on Quercus

Attendance

Attendance in lectures is not required, but students are encouraged to attend lectures or view lecture recordings through "Lecture Easter Egg Quizzes" which are each worth 0.25%.

TAs take attendance in tutorial with each attended tutorial being awarded 1%. If student participation in tutorial is disruptive, TAs may decide to not award attendance credit.

Participation + Conduct in Class

TAs take attendance in tutorial with each attended tutorial being awarded 1%. If student participation in tutorial is disruptive, TAs may decide to not award attendance credit.

Recording Lectures (by Student)

Course lectures will be recorded and available through OCCS on the Quercus course homepage.

It is not expected that tutorials will be recorded or that recordings of tutorials will be made available to students.

Plagiarism Detection Tool

Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation web site (<https://uoft.me/pdt-faq>).

Religious Accommodations

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. For my part, I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity

(such as a test or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

Students with Disabilities or Accommodation Requirements

Students with diverse learning styles and needs are welcome in this course. 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/departments/accessibility-services/>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

Academic Integrity

All suspected cases of academic dishonesty will be investigated following procedures outlined in the [Code of Behaviour on Academic Matters](https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019) (<https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019>). If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources. For example, to learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at <http://www.writing.utoronto.ca>. Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see [A&S Student Academic Integrity](https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity) (<https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity>) and the [University of Toronto Website on Academic Integrity](https://www.academicintegrity.utoronto.ca) (<https://www.academicintegrity.utoronto.ca>).

Specific Medical Circumstances

If you become ill and it affects your ability to do your academic work, consult me right away. Normally, I will ask you for documentation in support of your specific medical circumstances. This documentation can be an Absence Declaration (via ACORN) or the University's Verification of Student Illness or Injury (VOI) form. The VOI indicates the impact and severity of the illness, while protecting your privacy about the details of the nature of the illness. If you cannot submit a VOI due to limits on terms of use, you can submit a different form (like a letter from a doctor), as long as it is an original document, and it contains the same information as the VOI (including dates, academic impact, practitioner's signature, phone and registration number). For more information on the VOI, please see <http://www.illnessverification.utoronto.ca>. For information on Absence Declaration Tool for A&S students, please see <https://www.artsci.utoronto.ca/absence>. If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible.

Accommodation for Personal Reasons

There may be times when you are unable to complete course work on time due to non-medical reasons. If you have concerns, speak to me or to an advisor in your College Registrar's office; they can help you to decide if you want to request an extension or other forms of academic consideration. They may be able to email your instructors directly to provide a College Registrar's letter of support and connect you with other helpful resources on campus.

Quercus Info (if using)

This Course uses the University's learning management system, Quercus, to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. New information and resources will be posted regularly as we move through the term. To access the course website, go to the U of T Quercus log-in page at <https://q.utoronto.ca>. SPECIAL NOTE ABOUT GRADES POSTED ONLINE: Please also note that any grades posted are for your information only, so you can view and track your progress through the course. No grades are considered official, including any posted in Quercus at any point in the term, until they have been formally approved and posted on ACORN at the end of the course. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.

Online Communication

- Our course piazza discussion board will be generally be monitored from 12-1PM ET and 5-6PM ET on Tuesday and Wednesday, and 12-1PM ET on Thursday

"This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com. Find our class signup link at: <https://piazza.com/utoronto.ca/fall2024/sta130>"

- Communications that are not "course content" questions and are in some sense "of private rather than public interest" should be directed to sta130@utoronto.ca which will be monitored Mondays between and after LEC 11AM-1PM and 3-5PM ET
- TAs are instructed to not use their personal emails to communicate with students.

Harassment/Discrimination

Some instructors choose to include syllabus statements directly addressing policies regarding harassment and discrimination, including sexual harassment. We have not provided sample text here, as this is best crafted by each instructor, in conversation with colleagues. Helpful documents to consider when thinking through this question include the ["Conflict of Interest and Close Personal Relations"](#) guideline and the policies and guidelines on Workplace Conduct collected at the [Human Resources and Equity website](#).

Privacy/FIPPA Statement

Personal information is collected pursuant to section 2(14) of the University of Toronto Act, 1971 and at all times it will be protected in accordance with the Freedom of Information and Protection of Privacy Act. Please note that this course requires presentations of one's work to the group. For more information, please refer to <http://www.utoronto.ca/privacy>.

Re-marking Policy - Timeline and Protocol

All remark requests must be submitted through the "Remarks/Late Submissions" form available on Quercus within two weeks of the date that marks are returned to the students.

Mental Health and Well-Being

Your mental health is important. Throughout university life, there are many experiences that can impact your mental health and well-being. As a University of Toronto student, you can access free mental health and wellbeing services at Health & Wellness (<https://studentlife.utoronto.ca/departments/health-wellness/>) such as same day counselling, brief counselling, medical care, skill-building workshops, and drop-in peer support. You can also meet with a Wellness Navigation Advisor who can connect you with other campus and community services and support. Call the mental health clinic at 416-978-8030 ext. 5 to book an appointment or visit <https://uoft.me/mentalhealthcare> to learn about the services available to you.

You can also visit your College Registrar to learn about the resources and supports available: <https://www.artsci.utoronto.ca/current/academic-advising-and-support/college-registrars-offices>

If you're in distress, you can access immediate support: <https://uoft.me/feelingdistressed>

Equity, Diversity and Inclusion

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.