

University of Toronto
Department of Statistical Sciences

STA201H1S LEC0101: Why Numbers Matter?
Syllabus: Winter 2023

Land Acknowledgement

We wish to acknowledge the land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

Table of Contents

1. Course logistics (Instructor and Team, Class time, Office hours)	2
2. Course Overview	2
3. Course Materials	2
4. Course Components	3
5. Evaluation Breakdown	3
5.1 Grading Scheme	3
5.2 Assessment Formats/Platforms, Missed Assessments and Marking Concerns	4
6. Communication	5
7. Intellectual Property	5
8. Accessibility	5
9. Accommodations	5
10. Academic Integrity	5
11. Class Schedule – Tentative	6

Course Formats Highlights

This course is an in-person course. Any deviations from this document will be announced on the Quercus course pages. Please keep regularly visited the website link [FAS student FAQs](#) and the course pages at the Quercus.

1. Course logistics (Instructor and Team, Class time, Office hours)

Course: STA201 H1S Winter 2023: Why Numbers Matter?

Instructor: Murari Singh

Email: murarii.singh@utoronto.ca

Class Day/Time: **Monday** - SS1083 (2:10 – 3 pm & 3:10- 4 pm), **Wednesday**- SS1073 (2:10 – 3 pm)

Office hours: **Friday**, 2 - 3 pm via zoom-link (posted on Quercus).

TAs and their office hours will be announced on Quercus.

Communicating with the Instructor: Before emailing your instructor, please:

1. re-read **this syllabus** to see if the answer is here,
2. check the discussion posts on Quercus,
3. ask your Teaching Assistant (TA),
4. post your question to the appropriate discussion board on Quercus.
5. go to office hours

If your question is not answered after looking through the above resources, then please email the instructor. **When emailing your instructor, please use the subject line: STA201 – LEC0101.** Here, STA201 is your course code and LEC0101 is your section. **If this is not included in the subject line, your email may be missed.**

2. Course Overview

Course Description: This course teaches non-science students the importance of quantitative reasoning and graphical presentations in many different areas. It explores a variety of applications in diverse subjects such as economics, gambling, politics, poetry, graphics, music, medicine, demographics, sports, secret codes, and more, using only basic high school level mathematics combined with logical thinking.

Content for this course is drawn from the textbooks. The lecture notes will include summaries, examples, and exercises. It is important to attend all lectures, as there is normally no simple way to make up for missed lectures (perhaps obtain another student's notes). There will also be many examples requiring simple computations using MS Excel software.

Learning Outcomes: By the end of this course, all students should have a basic understanding of the quantitative reasoning, key concepts and illustrations using applications in various fields to acquire numerical and statistical literacy.

3. Course Materials

Course Content: The lecture materials drawn from the textbook (“Quantitative Literacy”) will be used to cover concepts and examples on logic, growth analysis, graphical presentation of measurements, financial calculations, data collection and summarization, relationships between different types of variables, basic probability and its application, estimation of proportion and means, sizes of commonly used geometric objects. The instructor edited version will be posted on the Quercus course page for each lecture session. The in-person lecture will focus on explaining the concepts and discuss examples and solve some exercises.

Textbooks: The lectures will be based on the topics and exercises given in the following textbooks.

1. “Quantitative Literacy: Thinking Between the Lines” 3rd Ed, 2022, Authors: Crauder, Evans, Johnson, and Noell, Publisher: WH Freeman.

The Book Store link for purchase of the digital material for STA201:

<https://www.uoftbookstore.com/adoption-search-results?ccid=64945&itemid=51740>

2. "Seeing Through Statistics" 4e, J. Utts, Cole/Brooks (2021) [STS]
 The Book Store link for 4e 1 Year Access to the adoption for STA201:
<https://www.uoftbookstore.com/adoption-search-results?ccid=64945&itemid=51589>

Computations

MS Excel software will generally be sufficient to meet the computational need of this course. However, you may also use R/RStudio, which can be accessed through <https://jupyter.utoronto.ca/> as well.

Calculators

You will need a calculator. Any calculator that has logarithmic functions will be sufficient. Calculators on phones or other devices equipped to communicate with the outside world (for example, through the internet or cellular or satellite phone networks) will not be permitted during the term tests or final exam.

4. Course Components

Lectures: Lectures will be in-person discussed using a projector in the classroom. Lecture notes prepared by the instructor using textbook and other resources covering the topics and exercises will be used. Computations and simple graphs would be presented using the Excel software. However, the computations for simple applications will also be demonstrated using R/RStudio.

Quercus Discussion Board: We will be using the Quercus Discussion Board as an online discussion forum. **All questions about course material should be posted here** or asked TA/instructor during their office hours. The instructor and TAs will monitor the board and will help answer questions, but students are encouraged to answer posts and help their fellow classmates.

5. Evaluation Breakdown

Assessments will be conducted based on the lecture materials presented and will be in form of homework: best five of the six homework assignments -- three multiple-choice (MC) questions on Quercus Quizzes, two short-answer (SA) questions via Crowdmark, and an in-person mid-term test and an in-person final exam. Information about these assessments will be posted on Quercus at least 1 week before the assessment. Any specific details will be available with the published at the Quercus Quizzes or distributed assessments via Crowdmark.

5.1 Grading Scheme

All students will be evaluated as in the following. The higher of the two options (a) and (b) will be the course grade.

Assessment	Due dates in 2023		Marks (%)	
			(a)	(b)
Homework (4 × 7%) (best 4 out of 5 HWs)	MC Qs on Quercus Quizzes	SA Qs via Crowdmark	28%	28%
	HW1(MC): 27 Jan, Friday	HW2(SA): 10 Feb, Friday		
	HW3(MC): 17 Feb, Friday	HW4(SA): 17 Mar, Friday		
		HW5(SA): 6 Apr, Thursday		
Midterm Test	27 Feb 2023, Monday, 2:20 – 3:50 pm		32%	40%
Final Exam	TBA (by the Faculty of Arts and Science)		40%	32%

HW: Homework. MC: Multiple choice questions. SA: Short answer questions.

See the Course Schedule for the contents covered under above assessments.

Minimum passing requirement

In addition to the U of T grading policy, students must complete the final assessment to pass the course.

5.2 Assessment Formats/Platforms, Missed Assessments and Marking Concerns

5.2.1 Homework assignments

The homework assignments are multiple choice (MC) questions on Quercus Quizzes or short-answer (SA) questions distributed to the students via Crowdmark. For the SA questions, students will upload their answers (as PDF files or images) on Crowdmark. You may use the link: <https://crowdmark.com/help/completing-and-submitting-an-assessment/> to familiarize with assessment submission to the Crowdmark.

5.2.1.1 Late Penalty for Homework Assignments

- A 25% per day penalty will be applied to short answer assignments that are submitted late. For example, this means that if an assignment is due at 17:00, and is submitted at 17:01, then it will incur a 25% late penalty. If it is submitted at 17:01 the following day, then it will incur a 50% late penalty.
- The multiple-choice questions (on the Quercus Quizzes) must be submitted by the due date/time.

5.2.1.2 Missed Homework (due to valid reasons)

Since the best 4 of the 5 homework assignments will be counted, no accommodation is available for your first missed homework assignment because it will be automatically dropped.

If a homework is missed for a valid reason (e.g., illness or personal emergency), then within one week following the assessment you must fill out the absence declaration form on ACORN. For each such missed assignment, the 50% of the total weight (7%) for that homework assignment will be shifted to the other homework assignments (i.e., 3.5% weight will be shifted to other homework assignments) and the remaining to the final assessment (i.e., 3.5% weight shifted to the final). If you declare absence from all the homework assignments, then their total weights will be shifted to the final. Otherwise, a missed homework with undeclared absence on ACORN will be assigned a grade of zero.

Thus, for a homework, submission in time, late submission with penalty, missing it for valid reasons and filling out the ACORN absence declaration form, or not submitting the homework and also not filling out the ACORN absence declaration are the only options. There is no alternate/makeup for missed homework.

5.2.2 Midterm Test

The midterm tests will be an **in-person** exam during class time on **27 February 2023**. The test will have multiple choice and/or short-answer questions.

Missed Midterm Test (due to valid reasons)

If the midterm test is missed for a valid reason (e.g., illness or personal emergency), then within one week following the assessment you must fill out the absence declaration form on ACORN. In this case, the full weight of the midterm test will be shifted to the final exam (i.e., the final exam will be 72%). A missed midterm with undeclared absence on ACORN will be assigned a grade of zero.

There is no alternate/make-up for missed Midterm Test.

5.2.3 Final Exam

The final exam will be **in-person** during the time, date, and place decided by the Faculty of Arts and Science (FAS). The exam will have multiple choice and/or short-answer questions.

Students who are eligible for **special test accommodations** will be facilitated through the university's **Accommodated**

Testing Services (ATS).

5.2.4 Remark Requests

Any requests to have a homework assignment or midterm re-marked must be made in writing to the instructor within one week of receiving your marks. The request must contain a justification for consideration. Note that it is possible for a re-mark to result in a lower grade.

For the final exam recheck or reread, consult FAS website: <https://www.artsci.utoronto.ca/current/faculty-registrar/exams-assessments/exam-recheck-or-reread> .

6. Communication

Please do not email the instructor with questions related to the content of the course. These types of questions are much easier to answer through the discussion board or during office hours. Emails that do not contain sensitive or personal information will be directed to post the questions on the discussion board. If you need to email the instructor for personal reasons, please use your official University of Toronto email address, include STA201H1S L0101 in the subject and include your full name and UTORid in the body of the email (in case we need to look anything up).

7. Intellectual Property

Course materials provided on Quercus, such as lecture slides, assignments, tests and solutions are the intellectual property of your instructor and are for the use of students currently enrolled in this course only. **Providing course materials to any person or company outside of the course is an unauthorized use.**

8. Accessibility

Students with diverse learning styles and needs are welcome in this course. If you have a disability/health consideration that may require accommodations, please feel free to approach Accessibility Services at 416-978 8060, studentlife.utoronto.ca/as and/or me as soon as possible. The Accessibility Services staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. The sooner you let them and me know your needs, the quicker we can assist you in achieving your learning goals in this course. More information can be found here: www.accessibility.utoronto.ca.

9. Accommodations

The University of Toronto supports reasonable accommodation of the needs of students who observe religious holy days other than those already accommodated by ordinary scheduling and statutory holidays. As mentioned on the webpage below, please let me know if you require accommodations or expect absences, and I will make reasonable effort to make accommodations at these times. More information: <https://www.vicereprovtstudents.utoronto.ca/policies-guidelines/accommodation-religious/> .

10. Academic Integrity

The University treats cases of plagiarism and cheating very seriously. It is the students' responsibility for knowing the content of the University of Toronto's [Code of Behaviour on Academic Matters](#). All suspected cases of academic dishonesty will be investigated following the procedures outlined in the above document. 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/>). Here are a few guidelines regarding academic integrity:

- You may consult class notes/lecture slides during homework, however sharing or discussing questions or answers with others is an academic offence.
- Students must complete all assessments individually. Working together is not allowed.
- Paying anyone else to complete your assessments for you is an academic misconduct.

- Sharing your answers/work with others is academic misconduct.
- Copying solutions to homework problems from online or a book is an academic offence.
- All work that you submit must be your own! You must not copy answers from anyone or anywhere else. Unacknowledged copying or unauthorized collaboration will lead to severe disciplinary action, beginning with an automatic grade of zero for all involved and escalating from there. Please read the UofT Policy on Cheating and Plagiarism, and don't plagiarize.

All the above applies to this course (STA201H1S) and its assessments.

11. Class Schedule – Tentative

This is the tentative outline for Winter 2023. Existing topics may be excluded, or additional topics may be added by course instructor's discretion.

Week	Content (Sources: “Quantitative Literacy” for Weeks 1 to 6 and 12 & “Seeing Through Statistics” for Weeks 7 to 11.)
1. (Week 1) Jan 9 M & Jan 11W	Introduction to course and an overall view. Chapter 1(Critical Thinking) (Simpson’s paradox, logic and informal fallacies, formal logic, and truth tables) (L1*.pdf, L2*.pdf, L2-3*.pdf) (L*.pdf lecture notes pdf file)
2. Jan 16M & Jan 18W	Chapter 1 (formal logic and truth tables, sets and Venn diagrams, Critical thinking, and number sense) (L4a*.pdf, L4b*.pdf)
3. Jan 23M & Jan 25W	Chapter 2 (Analysis of Growth: Measurements, Graphs, Misleading Graphs) (L5-6*.pdf). HW1(MC): Jan 27, Friday, Coverage: Jan 9 – 18
4. Jan 30M & Feb 1W	Chapter 3 (Lines and Linear Growth, Exponential Growth and Decay) (L7-8*.pdf)
5. Feb 6M & Feb 8W	(continued) Chapter 3 (Logarithmic Phenomena: Compressed Scales, Quadratics and Parabolas) (L9-10*.pdf), HW2(SA): 10 Feb, Friday, Coverage: Jan 23 -Feb 1
6. Feb 13M & Feb 15W	Chapter 4 (Personal Finance: Compound interest, Saving, Borrowing, Saving for long term, credit card, inflation) (L11-12*.pdf). HW3(MC): Feb 17, Friday, Coverage: 6 – 15 Feb.
(20, 21 – 24 Feb 2023)	Family Day & Reading Week: No classes
7. Feb 27M & Mar 1W	Midterm Test (Feb 27, Monday, 2:20 – 3:50 pm, Coverage: Jan 9 – Feb 15) Data collection (Lecture notes adapted from various sources) (L13*.pdf)
8. Mar 6M & Mar 8W	(continued) Data collection (L13*.pdf), Statistical summary and presentation (L14*.pdf) Relationship between various types of variables (Lecture notes adapted from various sources: L15*.pdf)
9. Mar 13M & Mar 15W	(continued) Relationship between various types of variables (Lecture notes adapted from various sources: L15*.pdf) Concept of probability and application of common probability models (Lecture notes adapted from various sources: L16-17*.pdf) HW4(SA): 17 Mar, Friday, Coverage: Mar 1 – Mar 13 (excluding Probability)
10. Mar 20M & Mar 22W	(continued) Concept of probability and application of common probability models (L16-17.pdf), Sampling distributions, and concept of estimation (Lecture notes adapted from various sources.) (L18-19*.pdf)
11. Mar 27M & Mar 29W	Estimation of a population proportion and a population mean (Lecture notes adapted from various sources: L20-21*.pdf)
12. Apr 3M & Apr 5W	Chapter 9 (Geometry: Perimeter, Area, and Volume; Proportionality and Similarity, Symmetries and Tiling) (L22-L23*.pdf) Review for the final exam. HW5(SA): 6Apr, Thursday, Coverage:13/15 Mar - 5 Apr (Probability onwards)

HW: Homework. MC: Multiple choice and numeric answer questions. SA: Short answer questions.