

EEB125 Winter 2024 Course Syllabus

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Teaching Team

- Prof. Tomomi Parins-Fukuchi
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- Prof. Krishnapriya Vishnubhotla
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 - office hours: Mondays 14:00-16:00, [Zoom](#) (in-person TBD)
- Prof. Michael Jongho Moon
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 - office hours: Fridays 11:00-12:00, TBD ([Zoom](#) for Week 1)

Teaching assistants:

- Meng Yuan
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- Puneeth Deraje
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 - office hours: Thursdays 13:00-14:00 at Earth Sciences Centre 3046
- Luna Taguchi
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 - office hours: Mondays 12:00-13:00 at Earth Sciences Centre 2055

Course Schedule

Lecture:

Day	Time	Location
Wednesday	1:10pm - 3:00pm	SS 1073

Labs:

Section	Day	Time	Location	TA
TUT0101	Thursday	12:10pm - 1:00pm	BF 215	TBD
TUT0102	Thursday	12:10pm - 1:00pm	SS 1086	TBD
TUT0103	Thursday	12:10pm - 1:00pm	AB 114	TBD
TUT0104	Thursday	12:10pm - 1:00pm	WO 35	TBD

Note: Labs begin on Thursday, January 18 (the second week of class).

Course Description

Life and physical scientists increasingly use big and complex datasets to answer questions about society and the natural world. In this course, students will develop introductory programming knowledge and data acumen to explore topics drawn from biology, chemistry, physics, and psychology. Students will learn to create and run computer programs, organize ideas using data to communicate clearly to others, break a complex problem into simpler parts, apply general data science principles to specific cases, distinguish causation from correlation and coincidence, and negotiate tradeoffs between different computational and statistical approaches.

Course Learning Objectives

By the end of this course, you will be able to:

- Write computer programs in Python to prepare data for statistical analyses and visualizations.
- Write computer programs in Python to conduct a variety of statistical analyses using Python and provide an oral and written interpretation of the results.
- Identify appropriate uses of computational and statistical methods to answer scientific questions, including their strengths and limitations.
- Clearly communicate the results of a data analysis to both technical and non-

technical audiences.

Tentative Weekly Schedule

Class	Week of	Topic
1	Jan. 8	Introduction to computing, Python, and Jupyter notebooks
2	Jan. 15	Data types and working with text
3	Jan. 22	Learning from data
4	Jan. 29	Modeling data, frequency distributions
5	Feb. 5	TBD
6	Feb. 12	Midterm test
–	Feb. 19	Reading week
7	Feb. 26	Introduce final project; introduction to data science packages
8	March 4	Exploratory data analysis, describing and visualizing data
9	March 11	Tests of statistical significance
10	March 18	Confidence intervals and Estimation
11	March 25	Statistical learning
12	April 1	Course wrap up

Evaluation

Assessment	Weight	Due Date/Date Held
Weekly homework	25%	Tuesdays 5:00pm
Midterm test	20%	Feb 14 1:10-3:00pm
Final project proposal	10%	March 10 5:00pm
Final project	15%	April 1 5:00pm
Final exam	30%	April Final Assessment period

Weekly Lab and Homework

Each week (except the week of the midterm and final week of class), you will attend your lab section and complete assigned homework exercises for the week. There will be 10 labs and homeworks in total.

In the lab, you'll be able to work with your classmates and your TA to practice and apply the knowledge and skills introduced in that week's lecture. The overall purpose of the labs is for you to gain experience using Python in a Jupyter notebook to compute and visualize data under the guidance of a teaching assistant. Labs will be designed to help you review course material and get started on the weekly homework exercises. While lab attendance is not graded, we **strongly recommend attending all labs** to help you stay on track throughout the semester, and get help if you need it.

You'll then have additional time after the lab to complete your assigned homework, and submit it by Tuesday at 5:00pm the following week. Your submitted homework will be graded both by TAs and by automated tests to check the correctness of your code.

Note: to give you flexibility throughout the semester, your two lowest homework grades will be dropped. This includes dropping grades of 0 when you do not submit a weekly homework.

Midterm Test

The midterm test will be held *online*, during regular class time. More details about the midterm will be posted closer to the date.

Final Project

The final project will involve students using data science methodologies to explore a scientific question, and communicate the results. A project proposal will be due on March 8, and the final project will be due on April 1. One of the goals of the project proposal is to give you feedback that can be incorporated into your final project.

Final Exam

The final exam will be held in-person, scheduled by the Faculty of Arts & Science. For more information on final exams, please see the FAS [Exams & Assessments](#) webpage.

Missed Assessments

Weekly Homework

Late weekly homework assignments will not be accepted for any reason, since we plan to post answers soon after the due date. If you do not submit a homework by the deadline then your grade on will be 0. NB: the two lowest lab and homework will be excluded when calculating your final grade.

Midterm Test

If you miss the midterm for any reason then you will have an opportunity to write a makeup midterm sometime during the same week (i.e., before February 17). If you miss both the scheduled midterm and the makeup midterm then you will receive a 0 for the midterm.

Final Project

Late project proposals and late final projects will be accepted, but there will be a penalty of 20% for each 24 hour period. For example, if the proposal is submitted on March 11 at 00:01 then 20% will be deducted, and if it's submitted March 12 then 20% will be deducted from your project proposal grade. If you submit a late proposal then the teaching team cannot guarantee feedback in a timely fashion which means that you may have less time to incorporate your feedback into your final submission.

Final Exam

For information on final exam absences and deferral requests, please consult the [Faculty of Arts and Science website](#).

Marking Concerns

Any requests to have an assessment remarked must contain a written justification for consideration. Marking requests should be made within one week of receiving your assessment. *Please note* that we reserve the right to reconsider the marking of every question on your assessment when you re-submit.

How to communicate with your instructors

Questions about course material or organization, such as,

- What do I change the colour of my plotting symbol?
- How do I do question 3?
- When is the term test?

should be posted on the discussion forum (Piazza) or asked in person. Questions can be posted anonymously (so that the author is anonymous to other students but not to the instructors), if desired.

If your communication is private, such as, I missed the test because I was ill, then e-

mail your instructor. Use your utoronto.ca e-mail account to ensure that your message doesn't automatically go to a Junk folder and include your full name and student number.

Use of ChatGPT / Generative AI

Students may use artificial intelligence tools for creating an outline for an assignment, but the final submitted assignment must be original work produced by the individual student alone.

Academic Integrity

You are responsible for knowing the content of the [University of Toronto's Code of Behaviour on Academic Matters](#).

As a general rule, we encourage you to discuss course material with each other and ask others for advice. However, it is not permitted to share complete solutions or to directly share code for anything that is to be handed in. When an assignment is required to be completed as a team, you may share solutions and code with other members of your team, but not with another team in the class. For example, "For question 2 what Python function did you use?" is a fair question; "Please show me your Python code for question 2" is not.

If you have any questions about what is or is not permitted in this course, please do not hesitate to contact your instructors.

Accessibility Needs

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the class room, or course materials, please contact Accessibility Services as soon as possible:

<mailto:accessibility.services@utoronto.ca> or <https://accessibility.utoronto.ca>.

Your Responsibilities

The course is designed to actively engage you in the course material. We hope you'll find this course on computation and data science interesting, challenging, and fun. In order for classroom sessions and labs to be effective, prepare by learning about the weeks concepts through completing the recommended problems and readings.