

**APS1070: Foundations of Data Analytics and Machine Learning
Fall 2020**

Instructor: Jason Riordon - jason.riordon@utoronto.ca

Lectures:

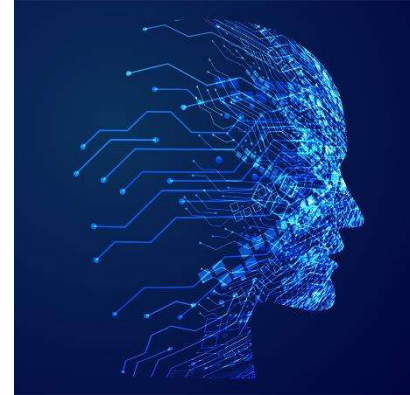
LEC0101: Tuesdays, 18:00-21:00, starting Sep 8

LEC0201: Wednesdays, 12:00-15:00, starting Sep 9

Practical Sessions:

PRA0101: Wednesdays, 18:00-20:00, starting Sep 9

PRA0102: Thursdays, 10:00-12:00, starting Sep 10



Students select 1 lecture and 1 practical session

TA contact info: TBD

Course description:

This course covers topics fundamental to data analytics and machine learning, including an introduction to Python and common packages, probability and statistics, matrix representations and fundamental linear algebra operations, basic algorithms and data structures and continuous optimization. The course is structured with both weekly lectures and tutorials/help sessions.

Grading:

Projects/Quizzes	Weight (%)	Notes
Project 1	14	Due Sep 27 @ 23:59
Midterm Quiz	12	Start Time: Oct 13 @ 18:00; End Time: Oct 14 @ 23:59
Project 2	20	Due Oct 18 @ 23:59
Project 3	20	Due Nov 8 @ 23:59
Project 4	20	Due Nov 29 @ 23:59
Final Quiz	14	Start Time: Dec 1 @ 18:00; End Time: Dec 2 @ 23:59

Project submissions will be online through Quercus. ***It is the student's responsibility to verify that projects are submitted on time.*** Projects that are late will incur a mark of zero.

Schedule of lectures and projects (preliminary–these may change):

Week	Date*	Lecture & Practical Session	Chapter**
1	Sep 8 / Sep 9	Course Overview, Machine Learning Intro	
	Sep 9 / Sep 10	No Practical Session	
2	Sep 15 / Sep 16	Classifiers, Cross-validation, Intro to Python Part I	PFDA 1-5
	Sep 16 / Sep 17	Project 1 Tutorial - Basic Data Science	
3	Sep 22 / Sep 23	Clustering, Big-O Notation, Intro to Python Part 2	PFDA 6-9
	Sep 23 / Sep 24	Project 1 Q&A - Basic Data Science	
4	Sep 29 / Sep 30	Performance Metrics, Statistics & Gaussians, Linear Algebra	MML 1,2,6,11
	Sep 30 / Oct 1	Project 2 Tutorial - Anomaly Detection	
5	Oct 6 / Oct 7	Analytical Geometry, Matrix Decompositions, Quiz Example	MML 3,4
	Oct 7 / Oct 8	Project 2 Q & A - Anomaly Detection	
6	Oct 13 / Oct 14	Midterm Quiz Oct 13 @ 18:00 - Oct 14 @ 23:59	
	Oct 14 / Oct 15	Project 2 Q & A - Anomaly Detection	
7	Oct 20 / Oct 21	Quiz Review, PCA+SVD	MML 10
	Oct 21 / Oct 22	Project 3 Tutorial - PCA	
8	Oct 27 / Oct 28	Vector Calculus	MML 5
	Oct 28 / Oct 29	Project 3 Q & A - PCA	
9	Nov 3 / Nov 4	Reading Week	
	Nov 4 / Nov 5	Project 3 Q & A - PCA	
10	Nov 10 / Nov 11	Continuous Optimization, Linear Regression, Convexity	MML 7,9; ESL: 2.3, 3.1-3.2.1
	Nov 11 / Nov 12	Project 4 Tutorial - Linear Regression	
11	Nov 17 / Nov 18	Linear Classification, Naïve Bayes Classifier	
	Nov 18 / Nov 19	Project 4 Q & A - Linear Regression	
12	Nov 24 / Nov 25	Deep Learning, Review	
	Nov 25 / Nov 26	Project 4 Q & A - Linear Regression	
13	Dec 1 / Dec 2	Final Quiz Dec 1 @ 18:00 - Dec 2 @ 23:59	
	Dec 2 / Dec 3	No Practical Session	

*Dates for all lectures and practical sessions are listed. Students attend one lecture and one practical session. **Reference material and chapters, with PFDA = [Python for Data Analysis, 2nd Edition](#), MML = [Mathematics for Machine Learning](#), ESL = [The Elements of Statistical Learning](#)

Student responsibilities:

It is the student's responsibility to attend lectures and labs, and ensure projects are submitted on time.

Academic honesty:

Do not submit code that you have not written yourself. Students suspected of plagiarism on a project, midterm or exam will be referred to the department for formal discipline for breaches of the Student Code of Conduct.

Inclusivity Statement:

All students and faculty at the University of Toronto have a right to learn, work and create in a welcoming, respectful, inclusive and safe environment. In this class we are all responsible for our language, action and interactions. Discriminatory comments or actions of any kind will not be permitted. This includes but is not limited to acts of racism, sexism, Islamophobia, anti-Semitism, homophobia, transphobia, and ableism. As a class we will work together to create an inclusive learning environment and support each other's learning.

If you experience or witness any form of discrimination, please reach out to the Engineering Equity Diversity & Inclusion Action Group [online](#), an [academic advisor](#), a [U of T Equity Office](#), or any U of T Engineering faculty or staff member that you feel comfortable approaching.

Accommodations:

If you have a learning need requiring an accommodation the University of Toronto recommends that students immediately register at Accessibility Services at www.studentlife.utoronto.ca/as.

Location: 4th floor of 455 Spadina Avenue, Suite 400

Voice: 416-978-8060

Fax: 416-978-5729

Email: accessibility.services@utoronto.ca

The University of Toronto supports accommodations of students with special learning needs, which may be associated with learning disabilities, mobility impairments, functional/fine motor disabilities, acquired brain injuries, blindness and low vision, chronic health conditions, addictions, deafness and hearing loss, psychiatric disabilities, communication disorders and/or temporary disabilities, such as fractures and severe sprains, recovery from an operation, serious infections or pregnancy complications.

Mental Health:

As a university student, you may experience a range of health and/or mental health issues that may result in significant barriers to achieving your personal and academic goals. The University of Toronto offers a wide range of free and confidential services and programs that may be able to assist you. We encourage you to seek out these resources early and often.

Health & Wellness Resources: undergrad.engineering.utoronto.ca/advising-and-wellness/health-wellness/

U of T Health & Wellness Website: studentlife.utoronto.ca/hwc

If, at some point during the year, you find yourself feeling distressed and in need of more immediate support, visit the **Feeling Distressed Webpage**: www.studentlife.utoronto.ca/feeling-distressed, for more campus resources.

Off campus, immediate help is available 24/7 through **Good2Talk**, a post-secondary student helpline at 1-866-925-5454.

All students in the Faculty of Engineering have an Academic Advisor who can advise on academic and personal matters. You can find your department's Academic Advisor here: uoft.me/engadvising