PROG 25211: AI and Machine Learning – Python Winter 2025

Class information:

Class Number: 1251_93622

Campus: Trafalgar

Room Number: J320

Class time: 3:00 pm – 6:00 pm

Contact information:

Humaira Siddiqui

Humaira.siddiqui@sheridancollege.ca

You can also use SLATE email to contact. All emails are answered within 24 hours on working days. If you email me in the evening expect a reply, the following day. If you do not receive a reply or an acknowledgement this means I have not received your email, especially if you have asked for an extension. You must always save the emails. Please have patience - I will respond as quickly as I can.

Office Hours:

Available by appointment only.

Course Outline

This is a course in Python that will cover concepts in machine learning and AI. It is assumed that you have some programming knowledge in Python. You will learn to develop applications using a variety of machine learning algorithms. You will train these models with various test data using real world examples. And you will make predictions based from these models.

In this course, you will learn how to implement Python libraries associated with:

- Data visualization and Data analysis
- Machine Learning models
- REST API

While we're at it, you will also learn something about:

- Popular design patterns
- Application of Machine Learning Models in real life scenarios.

General Advice

You learn skills for application development and computer science by doing them. To do well, you need to be actively engaged. This means coming to class on time, paying attention, taking notes, using class time to complete exercises and assignments, working on exercises and assignments outside of class time when necessary, and actively seeking help from the teacher, other students, on-line resources, and textbooks. If you miss a class for any reason, you should look at SLATE as soon as you can and contact other students and/or the professor to find out what you missed.

This class will only introduce you to the major patterns and architecture. We will be covering many subjects in very short amount of time. As a result, all students are encouraged to delve as deeply as they can into the various subjects on their own! Learn what you can while you can! It's all good to know!

Other Important Things You Need to Know!

- Refer to SLATE frequently, although we will cover everything in class there are several things you will find in SLATE
- Save CLASS PLAN document where you can find it easily, you should also have a printed copy at your desk for important dates etc.
- Exams, assignments, and exercises are to be completed on the dates discussed. In cases of extenuating circumstances where suitable supporting documentation is provided ahead of time, the professor may make arrangements for alternative completion dates.
- Late assignments will be frowned upon. The clock at Sheridan is always right. Late work will have 10% per day deducted for a maximum of three days at which point the window will permanently close. Get it done early and hand in an improved version up to the deadline if you like!
- Students are required to always conform to the Sheridan Code of Conduct.

Accommodations

If you are entitled to any accommodations, whether in the classroom, in course materials, on tests, or on assignments, please inform the professor early in the course. If no accommodations are presented, we will assume none are in place.

Discrimination and Harassment

Sheridan is committed to providing a learning environment that respects the dignity, self-esteem and fair treatment of every person engaged in the learning process. Behaviour which is inconsistent with this principle will not be tolerated. Details of Sheridan's policies on Harassment and Discrimination are available in the Student Handbook.

Week	Topic	Activity
Week 1 **Jan-06**	**Introduction** Installation and Python review	Reflective Journal 1 Exercise 1
Week 2 **Jan -13**	**Reading Data and Data Analysis** NumPy -> Arrays and Lists Pandas -> Collection manipulation built on NumPy Reading csv files	Exercise 2
Week 3 **Jan -20**	**Graphing Data** MatPlotLib Seaborn Data Visualization	Exercise 3 Reflective Journal 2
Week 4 **Jan -27**	**Supervised Learning** Linear Regression Logistic Regression	Exercise 4 **Assignment 1**
Week 5 **Feb-03**	**Supervised Learning** Decision Trees Random Forests	Exercise 5 Reflective Journal 3
Week 6 **Feb-10**	Catchup/Review	
Week 7 **Feb-17**	Midterm	
Feb-24	Reading Week ~ No Class	
Week 8 **Mar - 03**	**Supervised Learning** Natural Language Processing	Exercise 6 Reflective Journal 4
Week 9 **Mar - 10**	**Unsupervised Learning** K Nearest Neighbours K Means	Exercise 7
Week 10 **Mar - 17**	**Sharing Information** Restful With Python	***Assignment 2*** Exercise 8
Week 11 **Mar - 24**	**Unsupervised Learning** Big Data	Reflective Journal 5
Week 12 **Mar -31**	**Neural Networks**	
Week 13 **Apr- 07**	Catchup/Review	
Week 14 **Apr- 14**	FINAL EXAM	

Grade Breakdown

Assignments (2 @ 10% each)	20.0%
Exercises (8 @ 2.5% each)	20.0%
Reflective Journals (5 @ 2% each)	10.0%
Midterm Exam	25.0%
Final Exam	25.0%
Total	100.0%

To pass the course, students must achieve a 50% weighted average across the tests and the exams and at least 50% overall in the course.

Resources

- Laptop for class work, Ethernet cable for network hook-up
- Software: **VSCode**
- Course Material: On SLATE (Sheridan Learning and Teaching Environment) site

Plagiarism & Academic Dishonesty

Plagiarism happens whenever somebody takes credit for somebody else's work. Plagiarism in a computer program is as easy to spot as if two students handed in the same essay – word for word, even if the program formatting, layout, variable names, etc. have been changed to make them look different. Copying a program or part of a program from another student or from an online source without citing it is an act of plagiarism.

When plagiarism happens, all students involved are **equally** guilty, whether the plagiarism was intentional or not. The first time you are caught plagiarising you will receive a zero on the assignment and be reported to the administration. Consequences for subsequent offences (in this course and others) can be quite severe, possibly including withdrawal from the course or expulsion from the college.

Be warned! **Even the act of looking at someone else's code will shape the way you solve the problem!** Protect yourself: never write somebody else's program for them and don't let anybody peek at your own program for help!

Please refer to Sheridan Policy and Procedure for Academic Integrity and Late and Missed Work here:

http://policy.sheridanc.on.ca