Technology & Visual Arts

# AIDI 1002 – Machine Learning Programming

# **Course Instructor:** Miss Garima Malik

**Email:** [Garima.Malik@GeorgianCollege.ca](mailto:Garima.Malik@GeorgianCollege.ca)

**Class Time and Location:** 4:00 – 7:00 PM – Monday, Online (Remote Delivery)

# **Office Hours:** Appointments should be requested by emails

**Course Description:** In this course, students learn how to program machine learning models using common libraries to construct artificial intelligence systems. They will also work with real life case studies and datasets and applying the supervised and unsupervised learning methods to predict the meaningful patterns from the data.

**Resources:** Main resources will be Blackboard content and class notes with python labs.

# **Additional References:** To understand the Machine learning algorithms students can refer this book (**Introduction to Machine Learning, Fourth Edition, By Ethem Alpaydin** )

# Evaluation Criteria:

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| Machine Learning Labs | 20% of the final grade |
| Assignment 1 | 20% of the final grade |
| Assignment 2 | 20% of the final grade |
| Assignment 3 | 20% of the final grade |
| Final Exam | 20% of the final grade |

# Schedule of Activities:

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| --- | --- | --- | --- | --- |
| WEEK | DATE | LESSON | Assignment | Due |
| 1 | 1/10 | Basics of python and essential libraries for Machine Learning |  |  |
| 2 | 1/17 | Exploratory Data Analysis (EDA): Data collection, cleaning, manipulation, modelling and preparation | Week-1 lab viva |  |
| 3 | 1/24 | Feature Engineering and selection | Assignment – 1 Release and week-2 lab viva | Mon 7th Feb 2022 |
| 4 | 1/31 | Introduction to supervised learning: Classification and Regression problems with real life case studies | week-3 lab viva |  |
| 5 | 2/7 | Naïve Bayes, Decision Trees, Random Forest, Logistic Regression, Support Vector Machines | week-4 lab viva |  |
| 6 | 2/14 | Unsupervised Learning: K-means, KNN, hierarchical clustering, dendrogram | Assignment – 2 Release  week-5 lab viva | Mon 28th Feb 2022 |
| 7 | 2/21 | Family Day - Holiday - No Classes |  |  |
|  | 2/28 | Reading Week- No Classes |  |  |
| 8 | 3/7 | Dimensionality Reduction- PCA and LDA |  |  |
| 9 | 3/14 | Machine Learning Experiment Design (K-fold cross validation, confusion metrics, evaluation metrics, train-test splits, overfitting and underfitting) | Assignment – 3  Release  Week-8 lab viva | Mon 28th March 2022 |
| 10 | 3/21 | Introduction to neural networks and functional programming | Week-9 lab viva |  |
| 11 | 3/28 | Keras (TensorFlow) v/s Pytorch | Week-10 lab viva |  |
| 12 | 4/4 | ML basics with PyCaret part 1 | Week-11 lab viva |  |
| 13 | 4/11 | ML basics with PyCaret part 2 | Week-12 lab viva |  |
| 14 | 4/18 | Final Exam |  | Mon 18th April 2022 |

The sequence and content of this syllabus may change due to unanticipated opportunities or challenges, or to accommodate the learning styles of the students.