DOUGLAS COLLEGE
COMMERCE AND BUSINESS
ADMINISTRATION

CSIS 3290 – 002 37531: Machine Learning in Data Science

SEMESTER:	Fall 2023	**INSTRUCTOR:**	Fatemeh Ahmadi Abkenari
COURSE TIME:	Thursday 12:30PM-3:20PM	**ROOM:**	[Insert here]
EMAIL:	ahmadiabkenarif@douglascollege.ca	**TELEPHONE:**	[Insert here]
OFFICE HOURS:	Before and after the class	**LOCATION:**	[Insert here]

All times shown are in Pacific Standard Time (PST)

COURSE MATERIALS REQUIRED

Required and Recommended list of textbooks/materials/resources:

- Data Mining Concepts and techniques. Jiawei Han, Micheline Kamber, Jian Pei. Latest Edition. MK (Morgan Kaufmann).
- Learning Python, 5th edition, O'Reilly
- Python for data analysis, O'Reilly
- Python Machine Learning, 2nd edition Packtpub

COURSE SPECIFIC TECHNICAL REQUIREMENTS

Python, Anaconda, Jupyter, Spider, … or any Python code editor

CALENDAR COURSE DESCRIPTION

Fall 2023

COURSE OBJECTIVES

1. Install and use appropriate tools and libraries needed for Data Science
2. Understand and process data and features
3. Collect and Wrangle Data for further processing
4. Explore Data using statistics and visualizations
5. Transform Data to a structure suitable for data modeling
6. Model Data using machine learning algorithms

7. Evaluate model-based predictions

METHODS OF INSTRUCTION:

Lecture and Lab

MEANS OF ASSESSMENT:

Projects (5 Projects each 5%)	[25%]
Lab	[5%]
Midterm Exam	[30%]
Final Exam	[40%]
Total	**100%**

Notes:
- *If you <u>miss more than 30% of the scheduled classes</u>, you will* receive <u>UN Grade</u> for your course grade.

GRADING POLICY:

Grade	Numerical Value	Achievement Level
A+	4.33	90% to 100%
A	4.00	85% to 89%
A-	3.67	80% to 84%
B+	3.33	77% to 79%
B	3.00	73% to 76%
B-	2.67	70% to 72%
C+	2.33	65% to 69%
C	2.00	60% to 64%
C-	1.67	55% to 59%
D	1.00	50% to 54%
F	0.00	49% and below

Grade	Numerical Value	Achievement Level
UN	0.00`	Students completed less than 70% of the total evaluation of the course or <u>missed more than 30% of the class where the instructor's Course Outline specifies that attendance is a course requirement</u>.
W	N/A	Does not include GPA calculation

REGULATIONS FOR STUDENTS:

<u>LATE ASSIGNMENTS:</u> Late assignments/labs will not be graded and receive an automatic zero mark except for extraordinary circumstances or prior arrangements with the instructor. Students are encouraged to keep extra copies (i.e., photocopies or file backups) of their assignments in case of

data loss in the digital world.

MISSED TESTS OR FINAL EXAMINATION: Student will receive a zero mark for any missed test(s). Exceptions may be considered in cases of extraordinary circumstances such as accidents, deaths in the family, family emergencies' including sick children. It is the responsibility of the student to inform the College and/or the instructor at the earliest reasonable opportunity. Notification of the possibility of missing the test or exam must be done prior to the test or exam date/time and based on the instructor's preference might require supportive documentation where applicable.

CLASSROOM CIVILITY AND SHARED RESPONSIBILITY:

STUDENT CONDUCT: Any student who displays disruptive or dangerous behavior will be asked to leave the classroom/lab by the instructor. Such behavior will be classified as misconduct. Reprimands and appeals will be exercised according to the Douglas College Student Conduct policy.

TIMELINESS: Students are expected to be in class at the start of class. Any late student should enter the session and try to not interrupt the flow of class activity as per Douglas College Student Conduct policy.

CLASS CANCELLATION: If a class is cancelled due to unforeseen circumstances, a notification will be made through Blackboard to every student enrolled in the course. It is the responsibility of students to be proactive and to check their announcements and/or e-mail before coming to class. Every effort will be made to ensure that the notification is made as soon as possible.

ILLNESS AND OTHER UNAVOIDABLE CIRCUMSTANCES: Except in extraordinary circumstances, quizzes, tests, exam and assignment deadlines must be adhered too. If unable to attend or submit, advance notice must be provided via email at your earliest opportunity. On the email include
- Course and section number (e.g., CSIS1190-006)
- Your name and student number (e.g., Student Number 212121212)
- Late assignment or missed quiz (e.g., Missed Term Test #1)
- Brief comment (e.g., Explanation of reasoning)
Without documentation such as a doctor's letter, the instructor will discuss the most appropriate course of action that will lead to fair evaluation of your overall learning in the course. Students must use their Douglas College email account to communicate with the instructor and communication must be in English.

PREPARATION, ATTENDANCE AND PARTICIPATION: Attendance will be taken on a regular basis. The method of delivery includes classroom discussion and lab exercises; and students need to be present to participate and to learn.

STUDENT EFFORT: In addition to the scheduled times for classes and labs, students are expected to spend at least 10 hours a week on this course. If you are consistently spending more time than this, consider speaking with your instructor or reaching out to the Accessibility Centre for assistance.

This following schedule is tentative and subject to change, as per the College policy.
Please do not make any travel arrangements during the final examination period – final exam scheduling is beyond the instructor's control. Please see the Registrar's office immediately with any

conflict(s).

WEEK #	DATES	WEEKLY TOPICS AND ACTIVITIES	READINGS AND ASSIGNMENT DUE DATES
Week 01	2023-09-07	Programming language review for data analytics (Basic syntax, variables, control flow, loops, install and import libraries for data processing such as SciPy, NumPy, Pandas, Sci-Kit Learn, TensorFlow or other similar libraries and packages)	
Week 02	2023-09-14	Data and Features, represent data using lists, arrays for structured data, Work with data frames using packages such as Pandas to represent diverse data, Understand, determine and represent Features, Perform Data Wrangling	
Week 03	2023-09-21	Using libraries such as NumPy and Pandas (Use Control Flow for filtering data and performing filtered computations, Manipulate Data using functions and packages to process the data and perform computations	**Project#1**
Week 04	2023-09-28	Exploring Data: - using libraries such as Matplotlib, Visualize Data by creating plots using tools such as Matplotlib, Perform high dimensionality visualizations (Part1)	Click or tap here to enter text.
Week 05	2023-10-05	Exploring Data: - using libraries such as Matplotlib, Visualize Data by creating plots using tools such as Matplotlib, Perform high dimensionality visualizations (Part2)	
Week 06	2023-10-12	Feature Importance measurement	**Project#2**
Week 07	2023-10-19	Transforming Data: using libraries such as Sci-Kit learn, Create Data Transformers and apply dimensionality reducing techniques as PCA	
Week 08	2023-10-26	**Midterm Exam**	
Week 09	2023-11-02	Data Modeling: using libraries such as Keras, TensorFlow and scikit-learn, use machine learning techniques such as clustering, supervised learning, K-nearest neighbors, Regression to model the data (Part1)	**Project#3**
Week 10	2023-11-09	Data Modeling: using libraries such as Keras, TensorFlow and scikit-learn, use machine	Click or tap here to enter text.

Week	Date	Topic	Deliverable
		learning techniques such as clustering, supervised learning, K-nearest neighbors, Regression to model the data (Part2)	
Week 11	2023-11-16	Data Modeling: using libraries such as Keras, TensorFlow and scikit-learn, use machine learning techniques such as clustering, supervised learning, K-nearest neighbors, Regression to model the data (Part3)	
Week 12	2023-11-23	Data Modeling: using libraries such as Keras, TensorFlow and scikit-learn, use machine learning techniques such as clustering, supervised learning, K-nearest neighbors, Regression to model the data (Part4)	**Project#4**
Week 13	2023-11-30	Data Modeling: using libraries such as Keras, TensorFlow and scikit-learn, use machine learning techniques such as clustering, supervised learning, K-nearest neighbors, Regression to model the data (Part5)	
Week 14	2023-12-07	Evaluating Data: Evaluate modeled data using evaluation techniques, Create and apply confusion matrices, perform cross-validation using scoring metrics, Implement and apply power tuning and pipelining to evaluate the data (Part1)	**Project#5**
Week 15	2023-12-14	Evaluating Data: Evaluate modeled data using evaluation techniques, Create and apply confusion matrices, perform cross-validation using scoring metrics, Implement and apply power tuning and pipelining to evaluate the data (Part2)	
Week 16 - 17	2023-12-21	**FINAL EXAMINATION PERIOD**	

LINKS TO IMPORTANT INFORMATION AVAILABLE ON COLLEGE WEBSITE:

1. *Minimum technical requirements for taking courses online at Douglas College*
2. *Technical support information for students on the College website*
3. *Academic Integrity Policy (*Douglas College Educational Policy)

   Plagiarism and Cheating:

   The use and/or reference of any/all websites (e.g. coursehero.com or similar) which host copies of Douglas College course work assessments such as but not limited to Quizzes, assignments, midterms, labs, exams, practical work, etc. constitutes plagiarism**.**

<u>The students are not allowed to copy the code for the assignments and labs, each student work on its own dataset to perform data wrangling and data modeling and she/he cannot use the codes on the Web. It is mandatory to deliver original codes written by the students according to the lectures in the class applying it on the dataset approved by the instructor.</u>

https://www.douglascollege.ca/current-students/important-dates-information/academic-integrity-resources

4. *[Course transferability](#)*
5. *[Coivd-19 safety and guidance](#)*
6. *[Dates and Deadlines](#)*
7. *[Bookstore](#)*
8. *[Accessibility Services](#)* – Carrie Keen for CBA Students
9. *[Library](#)*

<u>!!!*** WISH YOU ALL THE VERY BEST FOR THIS COURSE ***!!!</u>