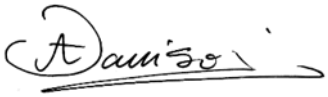
Approved by Chair:



Aug 21, 2022

Signature

COURSE SECTION INFORMATION

Applied Data Science

Teacher's Name: Reza Debaj

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Phone

Office

Out of Class Assistance

Course Code: COMP3122

Course Section

Academic Year: 2022-2023

Term: Fall 2022

All academic inquiries will be replied to within three business days.

LIST OF TEXTBOOKS AND OTHER TEACHING AIDS:

Required:

- Python Data Science Handbook: Essential Tools for Working with Data (by Jake VanderPlas)
  ISBN-10: 1491912057 **ISBN-13:** 978-1491912058

Recommended:

- Free full text: under CC-BY-NC-ND license.
  GitHub repository: https://github.com/jakevdp/PythonDataScienceHandbook

Detailed Evaluation System

Assessment	Description	Outcome(s) assessed:	Week	Weight
Lecture Quiz 8 x 1.5%	The best 8 out of 11 quizzes will count.	1,2,3,4,5,6	2 to 14	12%
Lab Exercise 8 x 1%	The best 8 out of 11 exercises will count.	1,2,3,4,5,6	2 to 14	8%
Assignment 4 x 6%	Four Individual assignment	1,2,3,4, 5,6	TBA	24%
Final Project 1 x 10%	Final Project	1,2,3,4, 5,6	TBA	10%

Mid-term Exam	Mixed format test on week 1 to week 6	1,2,3,4	9	21%
Final Exam	Mixed format test on week 1 to week 13	1,2,3,4,5,6	15	25%

Learning Schedule / Topical Outline (subject to change with notification)

TOPICAL OUTLINE:

WEEK	Topic	Outcome(s)	Content	Chapter/ Reference
1		1, 2	- Introduction to the field of Data Science and the relationship between AI, Machine Learning and Data Science - Historic overview - Overview of the book, tools and libraries used in the course - Introduction to IPython and Jupyter Notebooks - Administrative	1
2		1, 2	- Python recap: - Python data types - String parsing and formatting - Python loops, list comprehension, generators - Exceptions and error handling	
3	1	1	- Introduction to NumPy - Understanding Data Types in Python - The Basics of NumPy Arrays	1,2
4	2	1	- Computation on NumPy Arrays: Universal Functions - Aggregations: Min, Max, and Everything in Between	4
5	3	1, 2	- Computation on Arrays: Broadcasting - Comparisons, Masks, and Boolean Logic - Fancy Indexing	3,4
6		1, 2	- Fancy Indexing - Sorting Arrays - Structured Data: NumPy's Structured Arrays - SKLearn (Hello World!)	3,4
7	4	1, 2	- SKLearn (Classical Example) - SKLearn (Visualization, What makes a - Dataset Valuable)	3
8			**Intersession Week**	
9			**MID-TERM EXAM**	
10	5	3, 4, 5	- SKLearn (Linear Regression, Writing a Pipeline) - pandas 101 - How do I read a tabular data file - How do I select a pandas Series from a DataFrame	5

			- Why do some pandas commands end with parentheses - How do I rename columns - How do I remove columns from a pandas DataFrame	
11	6	3, 4, 5	- How do I sort a pandas DataFrame - How do I filter rows of a pandas DataFrame by column value - How do I filter rows of a pandas DataFrame by column value - How do I apply multiple filter criteria - Q & A (01) - How do I use the axis parameter - How do I use string methods - How do I change the data type - When should I use a groupby	5
12	7	5, 6	- How do I explore a pandas Series - How do I handle missing values - What do I need to know about the pandas index (Part 01) - What do I need to know about the pandas index (Part 02) - How do I select multiple rows and columns from a pandas DataFrame - When should I use the inplace parameter in pandas - How do I make my pandas DataFrame smaller and faster	5
13	8	4, 5, 6	- How do I use pandas with scikit-learn to create Kaggle submissions - Q & A (02) - How do I create dummy variables - How do I work with date and time - How do I find and remove duplicate rows in pandas - How do I avoid a SettingWithCopyWarning in pandas	5
14	9	2, 5, 6	- How do I change display options in pandas - How do I create a pandas DataFrame from another object - How do I apply a function to a pandas Series or DataFrame - Review - Problem Solving	5
15			**FINAL EXAM**	

Please note: this schedule may change as resources and circumstances require.

For information on withdrawing from this course without academic penalty, please refer to the College Academic Calendar: http://www.georgebrown.ca/Admin/Registr/PSCal.aspx