

Course Addendum

Semester: Spring	Subject Code: BDP200	Section: NAA
Subject Title: Programming for Data Science		
Professor: Anita (Mahnaz) Malekzadeh	Office: Online	
E-mail: anita.malekzadeh@senecacollege.ca	Ext.	
Office Hours: TBA		

Please read this addendum to the general course outline carefully. It is your guide to the course requirements and activities.

Please refer to the course outline for learning outcomes, course description and text and materials. Please also visit sdds.senecacollege.ca for key information on courses, graduation requirements, transfer credit, and more from the School of Software Design and Data Science.

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Assessment Summary

Workshops	30%	
Final Project (Assignment)	20%	
Quizzes	15%	
Midterm	20%	
Final Exam	15%	

Course Policies

To obtain credit in this subject, a student must:

- Achieve a grade of 50% or better on the final assessment
- Satisfactorily complete Project
- Achieve a weighted average of 50% or better for the midterm and final assessment
- Achieve a grade of 50% or better on the overall course
- **Late submissions will incur a 20% penalty each day.**

Academic Policies:

<http://www.senecacollege.ca/about/policies/academics-and-student-services.html>

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TENTATIVE WEEKLY SCHEDULE

Week	Topic or Skill	Required Readings	Assessment (Weight)
Week 1 May 9-13	<ul style="list-style-type: none">• Motivation for the course• Why Python?• Building the Course Programming Environment• Introduction to Python: Types, Expressions, Variables and Assignments.	<ul style="list-style-type: none">• Chapter1 and Chapter2 from [1]• Introduction to Python by Sam Redmond (pdf)• Python-Overview• w3schools- Comments, Variables, Datatypes, Numbers• Introduction to How Computers Work• https://www.tiobe.com/tiobe-index/	
Week 2 May 16-20	<ul style="list-style-type: none">• Python math module• Python random module• String data type• Conditional/Selections Control statement• Functions	<ul style="list-style-type: none">• Chapter5, Chapter6 and Chapter7 from [1]• Python for Data Science: Functions in Python, Control Flow Structures• w3schools - Strings, If ... Else, Python Functions• programiz - Python Strings, Python Flow Control, Python Functions	Workshop1(3.75%)
Week 3 May 23-27 <small>Monday, May 23, Statutory Holiday - Victoria Day</small>	<ul style="list-style-type: none">• Loops, Break, Continue and Pass statements• Iterative Functions	<ul style="list-style-type: none">• Chapter7 and Chapter8 from [1]• w3schools - While and For Loops• programiz - Python Functions, Python Flow Control	Workshop2(3.75%)
Week 4 May 30-June 3	<ul style="list-style-type: none">• Data Structures: Tuple, Lists, Arrays, and Dictionary• Recursive Functions• Functions & Modules	<ul style="list-style-type: none">• Chapter12, Chapter16 from [1]• Python for Data Science: Functions in Python, Control Flow Structures• w3schools - Python Lists and Arrays• programiz - Lists, Tuple, and Dictionary, Python Recursion	Workshop3(3.75%) Qiu1(5%)
Week 5 June 6-10	<ul style="list-style-type: none">• Object-Oriented Programming – PartA: Defining classes, Instance variables and methods• Private variables and private methods• Class variables, Static methods and class methods	<ul style="list-style-type: none">• Chapter17 from [1]• Chapter20 from [2]• Chapter15 from [4]• Python for Data Science: Object-Oriented Programming in Python• w3schools - Python Classes/Objects• programiz - Python Object-Oriented Programming	Workshop4(3.75%)
Week 6 June 13-17	<ul style="list-style-type: none">• Object-Oriented Programming - PartB• Special methods• Introduction to Inheritance• Composition vs Inheritance	<ul style="list-style-type: none">• Chapter19 from [1]• Chapter15 from [4]• Chapter9 from [3]• w3schools - Python Inheritance• programiz - Inheritance	Workshop5(3.75%)
Week 7 June 20-24	Midterm (20%)		
Study Week of June 27 to July 1, 2022 - No Classes <small>Friday, July 1, Statutory Holiday - Canada Day</small>			
Week 8 June 4-July 8	<ul style="list-style-type: none">• File IO• Debugging, Exceptions, and Testing	<ul style="list-style-type: none">• Chapter11, and Chapter13 from [1]• w3schools - File Handling, Try Except• programiz - File I/O, Exception	Workshop6(3.75%) Assignment (20%)

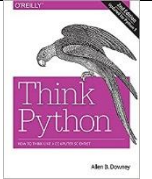


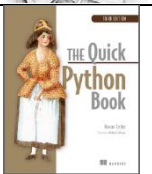

		Handling	
Week 9 July 11-15	<ul style="list-style-type: none"> • Python Libraries to Analyze Data: Pandas • Exploring data using pandas • Processing data with pandas 	<ul style="list-style-type: none"> • Chapter24 from [4] • Python for Data Science: Pandas • w3schools - Pandas Tutorial • 10 minutes to pandas 	Qiu2(5%)
Week 10 July 18-22	<ul style="list-style-type: none"> • Python Libraries to Analyze Data: Numpy • Getting Started with Numpy Arrays • Using array-generating functions • Indexing and Slicing Numpy Arrays 	<ul style="list-style-type: none"> • Chapter24 from [4] • Python for Data Science: Numpy Introduction • w3schools - NumPy Tutorial • NumPy quickstart 	Workshop7(3.75%)
Week 11 July 25-29	<ul style="list-style-type: none"> • Data visualization: Plotting in Python • Anatomy of a plot • Basic plotting with pandas and Matplotlib 	<ul style="list-style-type: none"> • Chapter24 from [4] • Python for Data Science: Data Visualization with Matlab • w3schools - Python Matplotlib, Pandas - Plotting • Matplotlib Tutorials 	Workshop8(3.75%)
Week 12 August 1-5 <small>Monday, August 1, Statutory Holiday - Civic Day</small>	<ul style="list-style-type: none"> • Data visualization: More advanced plotting with pandas/Matplotlib 	<ul style="list-style-type: none"> • Chapter24 from [4] • w3schools - Python Matplotlib • Matplotlib Tutorials: Advance 	Qiu3(5%)
Week 13 August 8-12	Course Review		
Week14 August 15-19	Final Exam (15%)		

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Disclaimer:

This course outline represents my current plans. Those plans may need to change to enhance the class learning opportunity as we go through the semester. Such changes, communicated clearly, are not unusual and should be expected.

Reference Material

<p>[1]. Downey, Allen B., Think Python: How to Think Like a Computer Scientist, 2nd Edition. O'Reilly, 2015.</p> <ul style="list-style-type: none"> ○ Think Python: Interactive Edition at https://runestone.academy/ns/books/published//thinkcspy/index.html ○ Obtain free PDF at http://greenteapress.com/wp/think-python-2e/ 	
<p>[2]. The Coder's Apprentice: Learning Programming with Python 3, Pieter Spronck, Spronck.net (2017)</p> <ul style="list-style-type: none"> ○ Obtain free PDF at http://www.spronck.net/pythonbook/pythonbook.pdf 	
<p>[3]. Fundamentals of Python: First Programs, 2nd Edition, Kenneth A. Lambert, ISBN-10: 133756009X, ISBN-13: 9781337560092, Paperback, COPYRIGHT: 2019 Published</p>	
<p>[4]. The quick python book, third Edition, Naomi Ceder, 2018, ISBN 9781617294037, 472 pages.</p> <ul style="list-style-type: none"> ○ Available online through Seneca Libraries: The Quick Python Book ○ https://livebook.manning.com/book/the-quick-python-book-third-edition/about-this-book/ 	
<p>[5]. Online Python Documentation:</p> <ul style="list-style-type: none"> ○ https://docs.python.org/3/contents.html ○ https://docs.python.org/3/tutorial/classes.html ○ The Python Tutorial (available from the Python website) 	

Required Software and Programming Language:

- We will use **Python 3** for the course. Python is an elegant language with compelling features.
- We will install **Anaconda** (<https://www.anaconda.com/>). So, we can build our programming environment.
- I will use **PyCharm** as an integrated development environment (IDE). The PyCharm is explicitly used for the Python language. It was developed by the Czech company JetBrains (<https://www.jetbrains.com/pycharm/>). You can download and use any other IDE, such as Visual Studio, or you can use any other editor, such as **Atom** (<https://atom.io/>).
- Also, I will use **JupyterLab** during the lecture. **JupyterLab** is an open-source web-based user interface for doing data science. The JupyterLab interface consists of different components such as a file browser, terminal, image viewer, console, text editor, etc.

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