

DSCI 511: Python Programming for Data Science

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Program design and data manipulation with Python. Overview of data structures, iteration, flow control, program design, and using libraries for data exploration and analysis.

Course Webpage https://pages.github.ubc.ca/MDS-2024-25/DSCI_511_py-prog_students/README.html

Course GitHub repo https://github.ubc.ca/MDS-2024-25/DSCI_511_py-prog_students

License

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Course learning objectives

- Translate fundamental programming concepts such as loops, conditionals, etc into Python code.
- Understand the key data structures in Python.
- Understand how to write functions in Python and assess if they are correct via unit testing.
- Know when and how to abstract code (e.g., into functions, or classes) to make it more modular and robust.
- Produce human-readable code that incorporates best practices of programming, documentation, and coding style.
- Use NumPy perform common data wrangling and computational tasks in Python.
- Use Pandas to create and manipulate data structures like Series and DataFrames.
- Wrangle different types of data in Pandas including numeric data, strings, and datetimes.

Teaching Team

Section 001

Position	Name	Slack Handle
Lecture & Lab Instructor	Prajeet Bajpai	@Prajeet Bajpai
Teaching Assistant	Eric Lee	@Eric
Teaching Assistant	Kaiyun Guo	@Kaiyun Guo (TA)
Teaching Assistant	Mohit Pandey	@(TA) Mohit Pandey

Section 002

Position	Name	Slack Handle
Lecture & Lab Instructor	Tiffany Timbers	@tiff
Teaching Assistant	Kate Manskaia	@Kate Manskaia - TA
Teaching Assistant	Nima Hashemi	@Nima Hashemi
Teaching Assistant	Md Shahriar Rahim Siddiqui	@Shahriar (TA)

Section 003

Position	Name	Slack Handle
Lecture Instructor	Scott Mackie	@Scott Mackie
Lab Instructor	Jungyeul Park	@jungyeul
Teaching Assistant	Mingcong Li	@Mingcong

Lecture Schedule

Lecture	Topic	Readings	Supplemental videos
1	Introduction to Python via Pandas	Chapter 1 & Chapter 2 from Data Science: A First Introduction with Python	Programming in Python for Data Science: Module 1 & 0:00 - 29:10 of Programming in Python for Data Science: Modules 2 - 4
2	Data types, operators and tidy data	1st half of Chapter 3 from Data Science: A First Introduction with Python	43:57 - 1:03:40 of Programming in Python for Data Science: Modules 2 - 4 & 1:18:10 - 1:54:00 of Programming in Python for Data Science: Modules 2 - 4
3	Advanced data wrangling & pandas categoricals		1:56:37 - 2:17:56 of Programming in Python For Data Science: Modules 5 , 6, 8
4	Split-apply-combine & joins	2nd half of Chapter 3 from Data Science: A First Introduction with Python	29:10 - 35:00 of Programming in Python for Data Science: Modules 2 - 4 & 1:03:52 - 1:18:10 of Programming in Python for Data Science: Modules 2 - 4
5	Numpy	PDSH: Introduction to Numpy Numpy documentation: Quickstart tutorial	1:32:30 - 1:56:38 of Programming in Python For Data Science: Modules 5 , 6, 8
6	Review of data types & control flow	Iteration & Search and Conditionals and Recursion	1:18:10 - 1:54:00 of Programming in Python for Data Science: Modules 2 - 4 0:00 - 27:54 of

Lecture	Topic	Readings	Supplemental videos
		chapters of Think Python by Allan Downey	Programming in Python For Data Science: Modules 5 , 6, 8
7	Functions & testing	Chapters 14 , 15 and 16 of Think Python by Allan Downey	27:53 - 1:32:30 of Programming in Python For Data Science: Modules 5 , 6, 8
8	Object oriented programming & code style		

See the [lecture learning objectives](#) for a detailed breakdown of lecture-by-lecture learning objectives.

Deliverables

You are responsible for the following deliverables, which will determine your course grade:

Assessment	Weight	Due Date
Lab 1	10%	2024-09-07 18:00 PT
Lab 2	10%	2024-09-14 18:00 PT
Lab 3	10%	2024-09-22 11:59 PT
Lab 4	10%	2024-09-28 18:00 PT
Worksheet 1	1%	2024-09-07 18:00 PT
Worksheet 2	1%	2024-09-07 18:00 PT
Worksheet 3	1%	2024-09-14 18:00 PT
Worksheet 4	1%	2024-09-14 18:00 PT
Worksheet 5	1%	2024-09-22 11:59 PT
Worksheet 6	1%	2024-09-22 11:59 PT
Worksheet 7	1%	2024-09-28 18:00 PT
Worksheet 8	1%	2024-09-28 18:00 PT
iClicker	2%	During each lecture
Quiz 1	25%	2024-09-17 - 2024-09-20
Quiz 2	25%	2024-10-01 - 2024-10-04

Class Schedule & office hours

- Sections 001 & 002 see the [MDS-V calendar](#).
- Sections 003 see the [MDS-CL calendar](#)

Policies

Please see the general [MDS policies](#).