AI Academy

Python
Syllabus & Course Calendar

Cohort 5: January - March 2023
James E. Robinson, III

Overview

This course is designed to advance your understanding of the Python language and expand your coding toolset. Students will apply problem solving techniques to find solutions that can be implemented programmatically.

Course Format

This course consists of 2 primary components:

1. **Asynchronous Seminars**: Participants will independently watch a series of short lecture videos and review included slides and sample programs.
2. **Live Workshops**: Participants will attend live workshops on Monday/Wednesday (6:00-8:00pm Eastern) or Tuesday/Thursday (8:15-10:15pm Eastern). These will provide a hands-on opportunity to practice concepts covered in the lecture and to learn how to apply these concepts to data analysis with Python. Workshops will include small group work, as well as demonstrations from the instructors, where participants will follow along.

Instructors and Support

The course is taught by James Robinson with support from Travis Martin and Lori Kubik. Students can get support during the course by:

- Posting in course forums in Moodle. This is appropriate for any conceptual questions which other students might benefit from, or may be able to answer.
- Emailing ced-aia-python-pgm-winter-2023-support@wolfware.ncsu.edu - this is appropriate for private questions.
    - **Note**: Do not email staff directly. Use this email for quickest responses.
- Asking questions of peers and instructors during workshops.

Updated: Dec 29, 2022

Attendance and Expectations

Success in the AI Academy's Computer Programming with Python course is dependent on consistent participation throughout the 10-week course. Delivery of the course content is progressive in nature as each session builds on previous lessons. Participants that do not attend as expected will not be able to keep pace with the course.

Participants are encouraged to communicate upcoming absences (when possible) with the course instructors (use email above) to minimize any disruption in course progress.

The AIA Attendance policy limits absences to three. Participants that miss more than three (3) workshop sessions will be dropped from the course.

All participants are expected to keep up with weekly work, actively participate in the course, and seek support when needed. Specifically, participants must do the following each week:

1. **Before Each Workshop**: Complete the corresponding Seminar content (videos and code review) and submit any questions on Moodle before the workshop starts.
2. **During Each Workshop**: Attend the workshop and complete group practice work.
3. **After Each Workshop**: Submit workshop content for attendance (if required).

Cameras: During the live workshop, you are *generally* expected to leave cameras on to create a more authentic classroom environment and allow for more engagement. However, if you need to take a "camera break" (e.g. if your child is wandering through the room), feel free to do so.

Technology

We will use the following technologies:

- **Zoom**: Used in all live workshops and office hours. The workshop Zoom link is available at the top of the Moodle.
- **Moodle**: All resources, lecture materials and workshop notebooks will be available on Moodle. Moodle will also feature help forums for you to ask *public* questions (avoid posting partial answers to assignments).
- **Panopto**: All lecture videos are served through this platform.

AI Academy

Assessment

This course is not graded by the teaching staff. For further information about grading, please refer to your assigned mentors.

Each week you will have the following content due by the respective day:

Tuesdays	**Thursdays**	**Fridays**
Workshop 1 Notebooks	Workshop 2 Notebooks	Mentor Hours Submission

The notebook submissions are used to confirm workshop attendance. Please turn in what you have at the end of the workshop. You may continue working on the notebook after you submit it. The same notebook is used for Workshop 1 and Workshop 2. This will be explained in detail during the very first workshop.

Updated: Dec 29, 2022

AI Academy

Required Reading

You are required to read the corresponding chapters (given in the course schedule) before each corresponding workshop. A PDF of the first text is available in Moodle. A PDF of Tutorials Point materials is available for a nominal fee. Please see the links provided for details.

Title: Think Python (2nd Edition), 2016
Author: Allen B. Downey
ISBN-13: 978-1491939369; ISBN-10: 1491939362
https://www.amazon.com/Think-Python-Like-Computer-Scientist/dp/1491939362

Title: Python Data Structures, 2020
Author: Tutorials Point
https://www.tutorialspoint.com/python_data_structure

Title: NumPy Tutorial, 2016
Author: Tutorials Point
https://www.tutorialspoint.com/numpy

Title: Python Pandas Tutorial, 2017
Author: Tutorials Point
https://www.tutorialspoint.com/python_pandas

Title: Matplotlib Tutorial, 2016
Author: Tutorials Point
https://www.tutorialspoint.com/matplotlib

Title: Plotly Tutorial, 2019
Author: Tutorials Point
https://www.tutorialspoint.com/plotly

AI Academy

Schedule

The course schedule is below, but subject to change (as announced in class):

Week	Workshop Date	Topic	Readings
1	1/09/2023	Introduction & Review	Syllabus
	1/11/2023	Review	TP Ch. 1-2
2	1/17/2023	Functions & Scope	TP Ch. 3
	1/18/2023	Functions & Decorators	
3	1/23/2023	Recursion & Dynamic Programming	TP Ch. 5
	1/25/2023	Exception Handling	
4	1/30/2023	OOP - Composition/Encapsulation	TP Ch. 15-17
	2/01/2023	OOP - Inheritance	
5	2/06/2023	Collections of Objects/E-R Diagrams	TP Ch. 18, Appendix B
	2/08/2023	Data Structures - Lists	PDS Ch. 1,11
6	2/13/2023	Data Structures - Graphs/Trees	PDS Ch. 20
	2/15/2023	Data Structures - Traversals	
7	2/20/2023	File Handling - Advanced	See Moodle
	2/22/2023	File Handling - Structured	
8	2/27/2023	NumPy	See Moodle
	3/01/2023	NumPy	
9	3/06/2023	Pandas	See Moodle
	3/08/2023	Pandas	
10	3/13/2023	Statistics	See Moodle
	3/15/2023	Visualization	

NOTE: No class on Monday, January 16th, due to Martin Luther King, Jr. Day holiday. Please make every effort to attend the Tuesday workshop or view the Tuesday workshop recording that will be posted Wednesday morning.

Updated: Dec 29, 2022