

Python Programming for Data Analysis Section 01

CS 22B

Fall 2023 3 Unit(s) 08/21/2023 to 12/06/2023 Modified 08/20/2023

Contact Information

Instructor: Ms. Aarohi Chopra

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Please visit me during office hours:

- Monday 5-6 Group office hour for homework discussions virtually via Discord
- Friday 5-6 Virtually via Zoom (link on request)
- Additional office hours are available by request

For questions about course logistics or any other concerns, please email me at aarohi.chopra@sjsu.edu
(mailto:aarohi.chopra@sjsu.edu)

Course Description and Requisites

Hands-on Python programming skills for data analysis. Skills include finding a solution for a given problem and casting it as an algorithm, translating an algorithm to executable code, and debugging and testing code. Applications focus on computational techniques to understand, analyze, and visualize data.

Prerequisite(s): CS22A with a grade of C- or better, or consent of the instructor.

Letter Graded

* Classroom Protocols

The lectures are in person on monday and wednesday from 9:00 AM to 10:15 AM in MQH 422, zoom meetings are set up in case of emergencies.

No form of plagiarism, disrespect or harassment will be tolerated, including verbal comments and images that exclude people based on gender, socio-economic status, or appearance.

- **Attendance:** Strongly recommended and encouraged
 - **Be Punctual**
 - **Mute:** Unless you are speaking, keep your microphone on mute. *Mute upon entry.*
 - The video does not need to be on. Strongly recommend and encourage video to be on during individual office hours.
 - If your video is on, be **mindful of background distractions**
 - If there are distractions, use an appropriate and professional virtual background that is NOT objectively offensive or demeaning.
 - **Stay on top of coursework:** Students are responsible for their knowledge and any course-related work.
 - **Follow the rules of netiquette:** Be respectful. Be dressed appropriately if you want to turn your camera on.

- **Zoom recordings of the lectures(if any):** Posted by the end of the day. Email me if they are not.
 - You are only allowed to view it. You do not have permission to share the records or ANY course materials with someone who is not in this class.
 - These are protected by the instructor's copyright
- **Accessibility:** Any student that needs accommodations or assistive technology due to a disability should work with the Accessible Education Center (AEC), and the instructor.
- Emails are responded to within a day or two depending on the amount. Discord is another resource to reach out for small questions. Formal requests like delayed submissions or changing dates should always be sent via email.

Plagiarism: Any form of plagiarism or academic dishonesty is not tolerated. Homework problems should be based entirely on students' own work. Students can discuss general coding techniques, logic, and problem solving strategies for homework problems but this should never include copying. This is true for all courses at SJSU and the same standards and protocols will be used to detect and report plagiarism.

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Learning Outcomes (CLOs)

Upon successful completion of this course, you will be able to

1. Write programs using various data types and basic techniques such as function calls, loops, and conditionals.
2. Use and manipulate several built-in data structures such as lists, arrays, and dictionaries, including nested data structures.
3. Break a medium-sized problem down into smaller parts and solve each sub-problem individually.
4. Test and debug programs.
5. Use objects and associated methods provided by the programming language.
6. Learn about sorting algorithms and complexities.
7. Implement objects and associated methods.
8. Write recursive functions. (Optional lecture)

A more detailed overview of the topics can be gathered from the modules section in canvas.

Course Materials

There is no mandatory reading but the following are some additional resources.

Advanced Python for Biologists by Martin Jones, 2017,

ISBN-13: 978-1495244377, ISBN-10: 1495244377.

All course readings, examples, exercises, etc. will be assigned and provided by the instructor.

Course Requirements and Assignments

Late Submission: No late submission for the project, midterms, or final exam.

However, lab reports/hands-on per student might be accepted late under certain circumstances. Late submissions need to be handed in within a week and will be graded with 10% off for each day's extension. The student should let the professor know before the assignment submission about their delay only then will the assignment be considered for late submission. If a student informs about their missing submission after the due date they will not be allowed to submit it or receive credit.

Exams: You must submit only your own work only. Copying and any other forms of cheating will not be tolerated and will result in a failing grade (F) for the course and be reported to the department. If copying and any other forms of cheating are done on any type of assessment (midterm and final), this will be combined with other disciplinary actions from the university.

✓ Grading Information

Grading calculation will be based on the following:

- Final Exam 25%
- Hands-On 20%
- Participation 5%
- Midterm 1 15%
- Midterm 2 15%
- Project 20%

Grading Scale:

Percentage Range	Letter Grade	Percentage Range	Letter Grade
97.0% – 100%	A plus	72.0% – 76.99%	C
93.0% – 96.99%	A	70.0% – 71.99%	C minus
90.0% – 92.99%	A minus	67.0% – 69.99%	D plus
87.0% – 89.99%	B plus	62.0% – 66.99%	D
82.0% – 86.99%	B	60.0% – 61.99%	D minus
80.0% – 81.99%	B minus	<60.0%	F
77.0% – 79.99%	C plus		

1. Final Exam – 25%:

- Contact me if you cannot make it at least 3 weeks beforehand.

2. Hands-on – 20%:

- Help you understand the material and increase your skills.
- You are welcome to work with each other copying code isn't allowed. Collaboration may include discussing ideas, building logic, and verbal code skeletons.
- Only accepted through Canvas.
- Do not email it to the grader or professor.

3. Participation – 5%:

- Questions and quizzes will be given in the class at random and students are supposed to collaborate and attempt to answer those during class time.
- Participation assignments will be given which are to be submitted before the end of the day.
- Need to be present for all lectures.
- These assignments will be graded on the basis of participation and not correctness.

4. Midterm 1 and 2 – 20% (15% each): Contact me if you cannot make it to the midterm at least 2 weeks in advance.

5. Project – 20%:

1. Will include a paper, your group's code, peer evaluations, and a 10-min presentation
2. Each group contains 2 students.

University Policies

Per [University Policy S16-9 \(PDF\)](http://www.sjsu.edu/senate/docs/S16-9.pdf) (<http://www.sjsu.edu/senate/docs/S16-9.pdf>), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on the [Syllabus Information](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (<https://www.sjsu.edu/curriculum/courses/syllabus-info.php>) web page. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

Course Schedule – Tentative and Subject to Change:

Week	Date	Topic	Assignment Due
1	8/21	Syllabus. Introductions. Course Expectations. Google Collab. Recap of CS22A. Work on Lecture 1 Participation Question 1 open	Assigned on 8/21: Pre-Reqs check Due on 8/21: Day 1 Participation Recap
2	8/23	Recap Q For Loops Slides for "For loop" + finish for loop portion of lecture 1	Due on 8/23: Pre-Reqs check
2	8/28	Practice Questions [Lab day]	
3	8/30	Recap	Assigned: Hands-On 1 Recap
3	9/6	Finish Recap. Start Intro to Pandas.	Due on 9/6: Hands-on 1
4	9/11	Intro to Pandas.	Assigned on 9/11: Hands-On 2 pandas
4	9/13	Data Visualization.	
5	9/18	Data Visualization.	Due on 9/18: Hands-on 2 Pandas

5	9/20	Dictionaries. Start Complex Data Structures.	Assigned on 9/20: Hands-On 3 Visualization
6	9/25	Complex Data Structures.	
6	9/27	List comprehension 1	Due on 9/27: Hands-On 3 Visualization Assigned on 9/27: Hands-On 4 LCs and Complex DS
7	10/2	Functional Programming	
7	10/4	Midterm Review Practice Midterm	Due on 10/4: Hands-On 4
8	10/9	Midterm 1	
8	10/11	Explanation of Midterm 1. Project Explanation Functional Programming Finish Up and Review Any Material.	Project Explanation
9	10/16	Functional Programming	
9	10/18	Group Assignment[Lab day]	Project Proposal Due Assigned on 10/18: Hands-On 5
10	10/23	Object-Oriented Programming.	
10	10/25	Object-Oriented Programming.	Due on 10/25: Hands-On 5 Functional#1
11	10/30	Object-Oriented Programming. Hands-on stuff	Assigned on: 10/30 Hands-On 6
11	11/1	Generators	

12	11/6	Exception Handling.	Due on 11/6: Hands-On 6 Functional#2 + OOP Assigned on: 11/6 Hands-On 7 Generators
12	11/8	Midterm 2 review + generator questions	
13	11/13	Midterm 2	
13	11/15	Explanation of Midterm 2 + Exception Handling.	Due on 11/15: Hands-On 7 Assigned on 11/15: Hands-on 8 Exceptions
14	11/20	Recursion as Extra credit for final	
14	11/22	Thanksgiving Holiday - Campus Closed (T)	
15	11/27	Presentation (Mandatory Class)	Due on 11/27: Hands-On 8 ALL PROJECT MATERIAL DUE on 11/26 11:59
15	11/29	Presentation (Mandatory Class)	
16	12/4	Final Review	
16	12/6	No class	
	5/13	FINAL EXAM: 7:15-9:30 AM	