

Advanced Programming with Python

CS 122

Fall 2026 In Person 3 Unit(s) 08/19/2026 to 12/07/2026 Modified 09/09/2026

Course Information

Course Schedule: In-person in MacQuarrie Hall 422. Mo/We 3:00 PM - 4:15 PM

Office Hours: Wednesday 11-NOON on Zoom

Class time will be spent either in "lecture" mode or in "lab" mode, explained in "Class Protocol" in this document.

You are required to bring your wireless laptop to each class.

Exams will be in-class.

Course materials such as syllabus, handouts, notes, hands-on exercise, project instructions, etc. can be found on Canvas at <https://sjsu.instructure.com>.

You are responsible for regularly checking with the Canvas messaging system to learn of any updates.

Course Description and Requisites

Advanced features of the Python programming language with emphasis on programming practice. Course involves substantial programming projects in Python.

Prerequisite(s): CS 146 (with a grade of "C-" or better) or instructor consent. Computer Science, Data Science, Computer Science and Linguistics, Applied and Computational Math, or Software Engineering majors only.

Grading: Letter Graded

* Classroom Protocols

Students are expected to adhere to the Student Conduct Code found at <https://www.sjsu.edu/studentconduct>

Additionally, students should regularly attend lectures and labs (if applicable), treat instructors and peers with respect, and refrain from the use of cell phones during any classroom activities.

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, students will be familiar with the following concepts and will be able to apply them in appropriate situations:

1. Design, implement and test readable, efficient programs that utilize Python built-in capabilities and follow Python best practices.
2. Understand implementation differences and performance tradeoffs associated with various Python data structures.
3. Manipulate and analyze large datasets and handle missing or inconsistent values.
4. Design and implement Python programs for data analysis and visualization, web development, and database interactions.

Course Materials

The following textbook will be made available in the course Canvas shell:

The Quick Python Book (Third Edition) by Naomi Ceder ISBN: 9781617294037

Biological data exploration with Python, pandas, and Seaborn by Martin Jones, 2020. ISBN-13: 979-8612757238

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

Python Programming Environment

Python 3.7 or above available at <https://www.python.org/downloads/> (<https://www.python.org/downloads/>)

Links to an external site.

Jupyter notebook (Google Colab) or VS Code

Course Requirements and Assignments

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities.

Quizzes (10%): Quizzes will take place in class only to assess students' knowledge of the course materials from the week before. A unique password will be provided for each quiz during the lecture. No make-up quizzes will be given.

Homework Assignments (20%): Homework assignments will be posted and must be submitted on Canvas. All assignments must be submitted by the posted due date to receive full credit. All works submitted on individual assignments must be your own. You may not share or copy code from fellow students or from the web/chatGPT. If someone else copies your work, with or without your permission, you will be held responsible.

Midterms (MT) (20%):

1. MT1 (10%): Oct. 7
2. MT2 (10%): Nov. 4

No make-up exams will be given if a student misses the midterm exam submission deadline (unless you have a legitimate excuse or other personal emergencies and can provide documented evidence).

Term Project & Presentation (30%): The final project is a group project. Each group consists of 2 to 3 students. Here are the key deliverables and due dates:

- Team Formation and Project Proposal: Sep. 14
- Deliverables and Timeline: Oct. 21
- Progress Report: Nov. 4
- Final Project Due: Dec. 2
- Presentation: Each group gives a 10-minute, in-class presentation during class time.
- Final Exam (20%): Final Exam is on Friday, Dec. 11 3:15 PM-5:15 PM

It is a comprehensive test, including topics covered at the beginning and throughout the course.

Grading Information

Grading calculation will be based on the following:

10% Quizzes

20% Homework Assignments

20% Midterm I (10%) & Midterm II (10%)

30% Term Project

20% Final Exam

Incomplete work: Points will be deducted for incomplete question responses and solutions that are partially functional. Consult individual assignment for details of point allocation for each problem.

Late Policy - Homework ONLY: Life happens - You can submit two homework late, no explanation why necessary. Please just add in the comment box of your submission "USING LATE PASS".

Late Passes: You can submit the assignment up to 3 days after the deadline.

Makeup Exams: You must submit only your own work on exams. Makeup exams will only be given in cases of illness (documented by a doctor) or in cases of documentable, extreme emergency.

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

The course schedule is subject to change with fair notice. Changes will be announced on Canvas.

Week	Day	Date	Topics
W1	We	Aug. 19	Syllabus; Introductions; Course Expectations
W2	Mo	Aug. 24	Strings
W2	We	Aug. 26	Lists, Tuples, Sets & Dictionaries
W3	Mo	Aug. 31	Control flow & comprehensions

Week	Day	Date	Topics
W3	We	Sep. 2	Basic functions, lambda, generator functions, decorators
W4	Mo	Sep. 7	LABOR DAY! NO CLASS!
W4	We	Sep. 9	Regular expressions
W5	Mo	Sep. 14	Working with files and Exception handling
W5	We	Sep. 16	Object-oriented programming
W6	Mo	Sep. 21	Object-oriented programming
W6	We	Sep. 23	Intro to Pandas, Series, and Dataframe objects
W7	Mo	Sep. 28	Data exploration using Pandas
W7	We	Sep. 30	Reshaping, Grouping and Categorizing data in Pandas
W8	Mo	Oct. 5	Intro to Seaborn for Data Visualization
W8	We	Oct. 7	Term Exam #1
W9	Mo	Oct. 12	Working with Relationship Database
W9	We	Oct. 14	Web Development with Flask
W10	Mo	Oct. 19	Web Development with Flask
W10	We	Oct. 21	Deploying web app to the cloud
W11	Mo	Oct. 26	Deploying web app to the cloud
W11	We	Oct. 28	Exam 1 answered
W12	Mo	Nov. 2	Make database handling easier with an Object-Relational Mapping (ORM)
W12	We	Nov. 4	Term Exam #2
W13	Mo	Nov. 9	Create GUI Application using Python-Tkinter
W13	We	Nov. 11	VETERANS DAY! NO CLASS!
W14	Mo	Nov. 16	Distributing Python applications
W14	We	Nov. 18	Writing Unit Tests

Week	Day	Date	Topics
W15	Mo	Nov. 23	Exam 2 answered
W15	We	Nov. 25	THANKSGIVING BREAK! NO CLASS!
W16	Mo	Nov. 30	Review
W16	We	Dec. 2	Final Project Due. Project Presentations
W17	Mo	Dec. 7	Project Presentations
W17	Fri	Dec. 11	Final Exam 3:15 PM-5:15 PM