SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Advanced Programming with Python

CS 122

Fall 2025 In Person 3 Unit(s) 08/20/2025 to 12/08/2025 Modified 08/18/2025

Contact Information

Instructor: Dr. Amith Kamath Belman

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- **Office:** MH 411

Office Hours

Tuesday and Thursday, 1:30 PM to 2:30 PM, In person at MH 411

Course Information

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Lecture

Tuesday, Thursday, 12:00PM - 1:15PM, DH 450

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). Computer Science, Applied and Computational Math, or Software Engineering majors only.

Letter Graded

Classroom Protocols

Regular attendance is an integral part of the learning process. Please arrive to class on time and make sure your cell phones are silent during the lecture. Your laptop must remain closed except for designated activities.

Students are expected to adhere to the Student Conduct Code found at http://www.sjsu.edu/studentconduct/ students/. 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.

Recording and Privacy

Students are prohibited from recording class activities, distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. This university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor.

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

Other Readings

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/
- Jupyter notebook
- IDE of your choice, such as PyCharm Community Edition

Course Requirements and Assignments

Homework Assignments

Homework assignments will be posted and submitted on Canvas. For full credit, they must be submitted by the posted due date and time. All work submitted on assignments must be your own. You may not share or copy code or answers from fellow students, from the web, or AI assistants . Infractions will be detected and will lead to an automatic 0. All involved in integrity violations will be held responsible.

There will be 7 homework assignments throughout the course in total, worth 16% of the total grade.

Hands-on in-class activities

Most lectures will include a hands-on lab/activity: you'll be given a link to a Jupyter notebook and you'll follow along on JupyterHub. You will export your work and submit it at the end of the lecture. Your submission will be graded for completion.

Hands-on in-class activities are worth 4% of total grade.

Quizzes

There will be periodic quizzes conducted in-class, on canvas, to assess students' knowledge of recent topics covered in the class.

There will be 6 quizzes in the course in total. The lowest quiz score among the 6 quizzes will be dropped for letter grade calculation. ***No make-up quizzes will be given.***

The quiz scores are worth 10% of the total grade.

Midterm Exams

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

Each midterm is worth 15% of the total course grade.

Project

The final project is a group project. Each group consists of 2 students. The project consists of 3 important components of the term project. The components and weightage are listed below:

- Project proposal , 2 points
- Project progress report, 3 points
- Project presentation, 15 points, Each group gives a 6-minute, in-class presentation.
- Teammates will also evaluate each other for contributions.

The project is worth 20% of the total grade.

Final Exam

The final exam is scheduled according to the SJSU Final Exam Schedule, on Dec 16th, 10:45 AM - 12:45 PM.

The Final Exam is worth 20% of the total grade.

✔ Grading Information

Academic Dishonesty

Students who are suspected of cheating will be referred to the Student Conduct and Ethical Development office and depending on the severity of the conduct, will receive a zero on the assignment or a grade of F in the course. Grade Forgiveness does not apply to courses for which the original grade was the result of a finding of academic dishonesty.

The instructor may, at any time, ask a student to explain the meaning of any part of an answer they have submitted. If the student cannot adequately explain their answer, the penalty for the first incident will be the loss of all points on that question. The penalty for the second and subsequent incidents will be the loss of all points on the assignment, along with a report to the Office of Student and Ethical Conduct.

Late Work - Homework assignments only

No submissions will be accepted more than two days late.

Late assignments will be evaluated with a 10% penalty for each day or partial day late. Late days include weekend days. For example, an assignment due on Tuesday by 5 PM will incur a penalty of 10% if submitted by 5 PM on Wednesday, 20% if submitted by 5 PM on Thursday, and will not be accepted after 5PM on Thursday.

Everyone gets two "free late days" for the semester. These are only applied for revoking the penalty and not applied for extending the deadline.

Hands-on in-class activities

Most lectures will include a hands-on lab: you'll be given a link to a Jupyter notebook and you'll follow along on JupyterHub. You will export your work and submit it at the end of the lecture. Your submission will be graded for completion. No late submissions are accepted.

This category is worth a total of 4% in final grade. The total percentage in this category will be rounded up to the nearest whole percent. For example, if you score 2.3% in this category, it will be rounded up to 3%.

Makeup Exams and Quizzes

Makeup exams and quizzes will only be given in cases of illness (documented by a physician) or in documentable, extreme emergency cases.

There are 6 quizzes in total. The lowest quiz score will be dropped for final grade computation.

Project

Project component due dates and presentation schedules are not flexible and no late submissions will be accepted.

Criteria

Type	Weight	Topic	Notes
Homework Assignments	16%		
Hands-on in-class activities	4%		
Quizzes	10%		
Midterm Exams	30%	(15% Midterm 1 and 15% Midterm 2)	
Project	20%		
Final Exam	20%		

Breakdown

Grade	Range	Notes
A+	97 to 100%	
A	93 to 96.99%	
A -	90 to 92.99%	

Grade	Range	Notes
B+	87 to 89.99%	
B	82 to 86.99%	
B -	80 to 81.99%	
C +	77 to 79.99%	
C	72 to 76.99%	
C -	70 to 71.99%	
D	60 to 69.99%	
F	below 60%	

University Policies

Per University Policy 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) 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. Readings (QP - *The Quick Python Book*, BD - *Biological data exploration with Python, pandas and seaborn*)

Date	Day	Topic	Readings	Quiz	HW	Project
21-Aug	Thur	Syllabus, Introductions, Logistics, Course expectations				
26-Aug	Tue	Basics, lists, tuples, sets,	Ch. 1 and Ch. 5 QP			
28-Aug	Thur	Strings, Dictionaries, Control flow	Ch. 6 and 7 QP, Ch. 8 QP			

2-Sep	Tue	Functions, Lambda, generator functions, decorators	Ch. 9 QP	Quiz 1	HW1, Due Sep 9	
4-Sep	Thur	Modules and scoping, and packages	Ch. 10 QP			
9-Sep	Tue	Classes and Object-oriented programming	Ch.15 QP		HW2, Due Sep 16	
11-Sep	Thur	Classes and Object-oriented programming	Ch.15 QP			
16-Sep	Tue	Working with files and Exceptions handling, Distributing Python applications	Ch.13 and 14 QP, Ch. 11 QP	Quiz 2	HW3, Due Sep 23	
18-Sep	Thur	Regular expressions, Unit Testing	Ch. 16 QP			
23-Sep	Tue	Intro to working with data and basic file wrangling	Ch. 20 QP			
25-Sep	Thur	Data analysis with pandas	Ch. 2-5 BD		HW4, Due Oct 21	Project team formation Due Sep 25 Project proposal Due Oct 14

30-Sep	Tue	Midterm 1 Review		Quiz 3		
2-Oct	Thur	Midterm 1				
7-Oct	Tue	Midterm Discussion, Data analysis with pandas	Ch. 7 and 9 BD			
9-Oct	Thur	Intro to seaborn, plotting	Ch. 7 and 9 BD			
14-Oct	Tue	plotting, Intro to databases	Ch. 12 and 13 BD			
16-Oct	Thur	Working with databases	Ch. 23 QP			
21-Oct	Tue	Working with databases, relational databases, ORM	Ch. 23 QP	Quiz 4	HW5, Due Oct 30	Project progress report due on Nov 4th
23-Oct	Thur	Creating a GUI application				
28-Oct	Tue	Creating a GUI application				
30-Oct	Thur	Intro to Web Development with Flask			HW6, Due Nov 13	
4-Nov	Tue	Midterm 2 Review		Quiz 5		
6-Nov	Thur	Midterm 2				
11-Nov	Tue	Veteran's Day - Campus Closed				

13-Nov	Thur	Midterm Discussion, Web development with Flask				
18-Nov	Tue	Web development with Flask, Deploying Web app				
20-Nov	Thur	Deploying Web app			HW7, Due Dec 1	
25-Nov	Tue	Review		Quiz 6		
27-Nov	Thur	Thanksgiving Holiday - Campus Closed				
2-Dec	Tue	Project Presentations				
4-Dec	Thur	Project Presentations				
16-Dec	Tue 10:45 AM 12:45 PM	Final Exam				