

San José State University
Department of Computer Science
CS 22A Python Programming for Everyone,
Section 2 and 4, Fall 2022

Course and Contact Information

Instructor: Nada Attar

Office Location: MacQuarrie Hall 218

Email: nada.attar@sjsu.edu

Office Hours: TuTh 12:30-1:30PM
Zoom Link: <https://sjsu.zoom.us/j/88412431349>
Appointment slots (required for office hours):
<https://calendar.google.com/calendar/u/0/selfsched?sstoken=UUIPZVdhWkdtZFI4fGRlZmF1bHR8ZmJhMGUzOTQ3YTM5MjIxODRmZTI2YjJmE1M2QyNGE>

Class Days/Time: Section 2: TuTh 6:00pm-7:15pm
Section 4: TuTh 10:30am -11:45am

Classroom: Section 2:
TuTh Online, Zoom Link: <https://sjsu.zoom.us/j/81663249635>
Section 4:
Tu: In-Person: Duncan Hall 450
Th: Online, Zoom Link: <https://sjsu.zoom.us/j/82241931136>

Prerequisites: Course is not open to computer science majors or minors or software engineering majors. Either B4 ready or non-B4 ready with a corequisite support course.

GE/SJSU Studies Category: B4

Course Description

Introduction to Python programming in interesting, relevant, and practical contexts for data science, such as data visualization, central tendency, hypothesis testing, sampling distributions, estimation, ANOVA, Chi-Squared Test, correlation, and regression. Basic

programming skills are developed to explore and analyze data from multiple disciplines. Fundamental programming constructs: iteration, conditional statements, built-in data structures, input and output, and functions.

Course Format

Class time will be spent either in “lecture” mode or in “lab” mode. You are required to bring your wireless laptop to each class. Exams will be in-class, hand-written, closed-book.

Course Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on my faculty web page on [Canvas Learning Management System course login website](http://sjsu.instructure.com) at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system through [MySJSU](http://my.sjsu.edu) at <http://my.sjsu.edu> to learn of any updates.

Course Goals

Provide students with the opportunity to learn and apply computer programming to solve real-world problems, exposing them to high-demand skills. Satisfies the GE area B4 requirement, except for Business, Psychology, and STEM-Ed majors.

GE Learning Outcomes (GELO)

Students will meet their 500 word count requirement with seven homework assignments, each averaging around 40 to 50 word count responses to word problems. Some explicit examples of these word problems are provided below under the appropriate GELO. The estimated word counts are listed as well.

Upon successful completion of this GE course, students will be able to:

- GELO 1. Use mathematical methods to solve quantitative problems including those presented in verbal form.
- GELO 2. Demonstrate the ability to use mathematics to solve real-life problems.
- GELO 3. Arrive at conclusions based on numerical and graphical data.

Program Learning Outcomes (PLO) for BS Data Science

Upon successful completion of this course, students will be able to:

- PLO 1: Analyze a complex problem involving large datasets and apply principles of computing and other relevant disciplines to identify solutions.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

CLO 1: Explain fundamental programming constructs such as assignments, sequential operations, iterations, conditionals, and defining functions in Python.

CLO 2: Use basic mathematical techniques for solving quantitative problems.

CLO 3: Apply fundamental programming construct and mathematical concepts in solving real world problems.

CLO 4: Use Python libraries to explore and analyze data.

CLO 5: Interpret data visualization and summary statistics in the context of a particular problem.

Required Texts/Readings

- **Textbook:** Practical Statistics for Data Scientists (PSDS): 50+ Essential Concepts Using R and Python by Peter Bruce, Andrew Bruce, and Peter Gedeck ISBN-13: 978-1492072942 ISBN-10: 149207294X

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

Video Supplement Lessons: Udacity videos. You do NOT need to subscribe to Udacity's services to use these videos. <https://classroom.udacity.com/courses/st095>. They can be accessed directly through Canvas. These are short videos (usually 1 to 3 minutes long) that present 1 to 2 ideas followed by a mini-quiz (does not affect your grade). These videos cover all the class topics.

Other technology requirements / equipment / material

Students will need to have either a personal laptop/desktop with Internet service or access to an on-campus computer lab. We will be using Python 3.7 available at <https://www.python.org/downloads/release/python-371/>. For the programming environment, we will be using Google Colab (<https://colab.research.google.com/>) with Chrome or any supported web browser.

Course Requirements and Assignments

The course will consist of homework, a term project, two in-class midterm exams, and a final exam.

Homework

All homework will be completed online. There will be a corresponding homework assignment for each day of lecture, and each assignment will be weighted equally. Each assignment will be accessible for around one week. The homework will reinforce and deepen the understanding of content discussed in lecture, and serve as preparation for the in-class midterm exams. No late assignments will be accepted. However, under exceptional

circumstances, one problem set per student might be accepted late. It will need to be handed in prior to the following class meeting and will be graded with 30% off. Such an extension should be requested from the instructor.

Term Project

There will be a programming group project. Each group consists of two students. Information on the term project, including topics and deadlines, will be given later. The term project is due on the 12th week of the semester. Each group will give a 10-minute, in-class presentation (5 minutes per student), during class time.

Midterm Exams

There will be two in-class midterm exams. The first midterm will be held in the 7th week of the semester. The second midterm will be in the 12th week of the semester. Success on the midterm exams will indicate a mastery of the associated materials. No make-up exams will be given unless proper documentation of an emergency is provided.

Final Examination

There will be a comprehensive final exam on a date and time to be determined.

University Credit Hour Requirement

Success in this course is based on the expectation that you 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, and studying. Plan on spending at least 7 hours per week outside of lecture time engaging with the course material.

Grading Information:

- In-class hands-on exercises (10%)
- Homework (30%)
- Quizzes (10%)
- Project (20%)
- One Midterm Exam (15%)
- Final Examination (15%)

At the end of the semester, after re-weighting the scores according to the scale above and totaling them, final grades will be assigned as follows:

Percentage	Grade
97 and above	A+
94-96	A
90 - 93	A-
87 - 89	B+
84 - 86	B

80 - 83	B-
77 - 79	C+
74 - 76	C
70 - 73	C-
67 - 69	D+
64-66	D
60-63	D-
59 and below	F

Grading Information for GE

For Fulfillment of Area B4: this course must be passed with a C- or better as a CSU graduation requirement.

Classroom Protocol

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.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at: <http://www.sjsu.edu/gup/syllabusinfo/>

CS 22A Python Programming for Everyone, Fall 2022 Course Schedule

PSDS - Textbook: Practical Statistics for Data Scientists, ULS - Udacity Video Lessons, HW - Homework

Wk	Date	Reading/ Video Assignment	HW	Topics
1	8/23, 8/25			Syllabus, Course Expectations, Python Interpreter, Introduction to Google Colab
1	8/30, 9/1	ULs Intro. To Stat. Res. Methods	HW1 due	Introduction to Python Programming, Introduction to Statistical Research Process

3	9/6, 9/8	PSDS Ch.1 p.7-13,29 ULs Cent. Tend.		Dictionaries, Lists, and Sets Introduction to Pandas Dataframe and Series Central Tendency
4	9/13, 9/15	PSDS Ch.2 p.13-19 ULs Variab. & Stand.	HW2 due	Loops and Conditional Statement Measures of Variability and Standardized Scores
5	9/20, 9/22	PSDS Ch. 2 p.69-71 ULs Norm. Dist.		Normal Distribution Visualizing Data with Graphs
6	9/27, 9/29	PSDS Ch. 2 p.57-61 ULs Samp. Dist.	HW3 due	Sampling Distribution and Margin of Error
7	10/4, 10/06	PSDS Ch. 2 p.65-68 ULs Estm.		Writing User-Defined Functions Estimation (Confidence Intervals)
8	10/11, 10/13	PSDS Ch. 3 p.93-96 ULs Hypoth. Testing	HW4 due	Hypothesis Testing t-Tests to Compare Means
9	10/18, 10/20	PSDS Ch. 3 p.110- 112 ULs 25-27		t-Tests to Compare Means Midterm Exam
10	10/25, 10/27	PSDS Ch.3 p.118-121 ULs One-wy ANOVA		One-way ANOVA
11	11/1, 11/3	PSDS Ch.3 p.123-124 ULs Two-yw ANOVA	HW5 due	Two-way ANOVA

12	11/8, 11/10	PSDS Ch.1 p. 30-36 ULs Correl.		Correlation
13	11/15, 11/17	PSDS Ch.4 p. 141-145 ULs Repr.	HW6 due	Regression
14	11/22, 11/24 (No Class)	PSDS Ch.4 p. 146-150 ULs Repr.		Regression
15	11/29, 12/1	PSDS Ch.4 p. 124-127 ULs Sqrd tests	HW7 due	Chi-Squared tests Project Presentations
16	12/6			Project Presentations
17	12/13	Final Exam Section 2: 5:30 PM to 7:45 PM Section 4: 9:45AM to 12:00 PM		