

CS 22B: PYTHON PROGRAMMING FOR NON-MAJORS II

San José State University

Computer Science Department

Section 01, Spring 2020

COURSE AND CONTACT INFORMATION

Instructor: Aniket Chandak.

Office Location: Duncan Hall 282 (DH 282)

Email: aniket.chandak@sjsu.edu

Office Hours: Tuesday & Thursday 3:15 pm – 4:15 pm

Class Days/Time: Tuesday & Thursday 9:00 am – 10:15 am

Classroom: MH 222

Prerequisites: CS22A or consent of the instructor. This course is intended for students pursuing a Minor in Bioinformatics.

COURSE FORMAT

- 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, hand-written, closed-book.
- Course materials such as syllabus, handouts, notes, hands-on exercise, project instructions, etc. can be found on Canvas Learning Management System course login website at <https://sjsu.instructure.com>. You are responsible for regularly checking with the Canvas messaging system to learn of any updates.

COURSE DESCRIPTION

Hands-on Python programming skills. Skills include casting a problem 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. This course is not open to computer science majors or minors, or software engineering majors.

Note: We will continue covering Python with a bias towards examples drawn from Biology.

COURSE LEARNING OUTCOME (CLO)

Upon successful completion of CS22B, students will be able to:

1. Write programs using various data types, and using basic techniques such as assignment, 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. Read and write data to and from text files, both as plain text and in structured formats.
4. Break a medium sized problem down into smaller parts and solve each sub-problem individually.
5. Test and debug programs.
6. Deal with data that may include missing elements or malformed representations.
7. Use objects and associated methods provided by the programming language.
8. Implement objects and associated methods.
9. Write programs that are easy to understand so that others may modify and improve them.
10. Make effective use of computational methods in their chosen field.
11. Acquire computational skills that give an edge in competing for jobs.

REQUIRED TEXTS/READINGS

Advanced Python for Biologists by Martin Jones, 2017, ISBN-13: 978-1495244377, ISBN-10: 1495244377.

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

COURSE REQUIREMENTS AND ASSIGNMENTS

1. **Hands-On Exercises (20%):** We will have a number of hands-on exercises. The purpose of the hands-on exercises is to develop your understanding of the material and your skills in problem-solving and in programming. Occasionally, you will be asked to come to the front of the class to go through your solutions (programs) and share them with (explain them to) the rest of the class.
2. **Problem Sets (20%):** Five problem sets that reinforce lecture and practical skills will be assigned. The purpose of the assignments is to develop your understanding of the material and your skills in problem solving and in programming. Problem sets will be submitted via Canvas for grading. Please note that you will be responsible for knowing/understanding the content in all Problem Set questions. Only a subset of the assigned problems will be graded (per homework). Assignments are due in the beginning of the lecture and must be submitted at Canvas by 11:59 am on the respective due dates:
3. **Term-Project (20%):** There will be a programming group project. Each group consists of two students. Information on the project, including topics and deadlines, will be given later. Each group gives a 10-minute, in-class presentation (5 minutes per student) on 05/05/2020 or 05/07/2020, during class time. The term-project is due on 05/05/2020.

4. **Term Exams (20%):**

Exam One: 03/05/2020

Exam Two: 04/16/2020

Exam One and Exam Two are each one hour and fifteen minutes long. All exams are in-class, closed-book and comprehensive. Make-up exams will be given only at the instructor's discretion. Note: If you fall behind, you will likely do poorly on the exams as well.

5. **Final Exam (20%):** A cumulative Final Exam will be given on May 19. If there is a time conflict, please inform the instructor at least two weeks in advance for rescheduling.

GRADING INFORMATION

Grading calculation will be based on the following:

- Hands-On Exercises (20%)
- Five Assignments/Problem Sets (20%)
- Term Project (20%)
- Two Term Exams (20%)
- Final Examination (20%)

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 assignments: No late assignment 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.

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.

Grading Scale:

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

No Extra Credit Assignments will be given.

CLASSROOM PROTOCOL

- **Dual Role of MH 222:** Lecture/Lab MH 222 will be used as a dual-purpose room. It can be a regular lecture room, or it can be a computer laboratory for hands-on exercises.

- **Lecture Mode:** This is when MH 222 is used as a regular lecture room. Students are expected to listen and follow the lecture. Be considerate to your classmates and follow the lecture. Do not use the computer and/or talk to your neighbor.
- **Lab Mode:** This is when MH 222 is used as a computer lab. Use the computers. Work collaboratively on problems of the Hands-On and share your ideas and solutions with your classmates.

We shall alternate between the two modes. A typical class will begin with a lecture (Lecture Mode) followed by a hands-on (Lab Mode).

- Regular class attendance is highly recommended and strongly encouraged.
- Please arrive to class on-time so that you benefit fully from the course experience and you do not disturb classmates and the instructor while class is in session.
- Students are responsible for knowing all materials covered in class lectures, readings, assignments, and other course-related work.
- Please do not use mobile phones during class time. Laptops, tablets and other devices should only be used for course-related purposes.

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 at <http://www.sjsu.edu/gup/syllabusinfo/>

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SECTION 01, SPRING 2020

COURSE SCHEDULE

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

Week	Date	Topics
1	1/23	Syllabus, Introductions, Course Expectations, Python Interpreter and Python Coding Style <i>Hands-On One and Book (MJ) Chapter One</i>
2	1/28	MJ Chapter One, Introduction, pages 1 – 8, and Review <i>Hands-On Two</i>
2	1/30	MJ Chapter Two, Trees, pages 10 – 32 <i>Hands-On Three</i>
3	2/4	MJ Chapter Two, Trees, pages 10 – 32 [Continuation] <i>Hands-On Three</i>
3	2/6	HW1 Due MJ Chapter Three, Complex Data Structures, pages 37 - 59 <i>Hands-On Four</i>
4	2/11	MJ Chapter Three, Complex Data Structures, pages 37 - 59 [Continuation] <i>Hands-On Four</i>
4	2/13	MJ Chapter Four, Object-Oriented Python, pages 65 – 94 <i>Hands-On Five</i>
5	2/18	MJ Chapter Four, Object-Oriented Python, pages 65 – 94 [Continuation] <i>Hands-On Five</i>

5	2/20	HW2 Due MJ Chapter Four, Object-Oriented Python, pages 65 – 94 [Continuation] <i>Hands-On Six</i>
6	2/25	MJ Chapter Four, Object-Oriented Python, pages 65 – 94 [Continuation] <i>Hands-On Six</i>
7	2/27	MJ Chapter Four, Object-Oriented Python, pages 65 – 94 [Continuation] <i>Hands-On Seven</i>
7	3/3	Review
8	3/5	Exam One
8	3/10	MJ Chapter Four, Object-Oriented Python, pages 65 – 94 [Continuation] <i>Hands-On Eight</i>
9	3/12	Exam One - Answered
9	3/17	MJ Chapter Four, Object-Oriented Python, pages 65 – 94 [Continuation] <i>Hands-On Eight</i>
10	3/19	Term project proposal due MJ Chapter Five, Functional Python, pages 110 – 142 <i>Hands-On Nine</i>
10	3/24	HW3 Due MJ Chapter Five, Functional Python, pages 110 – 142 [Continuation] <i>Hands-On Nine</i>
11	3/26	MJ Chapter Five, Functional Python, pages 110 – 142 [Continuation] <i>Hands-On Ten</i>
11	4/7	MJ Chapter Six, Iterators, Comprehensions, and Generators, pages 158 – 174 <i>Hands-On Eleven</i>
12	4/9	HW4 Due MJ Chapter Six, Iterators, Comprehensions, and Generators, pages 158 – 174 <i>Hands-On Eleven</i>
12	4/14	Review
13	4/16	Exam Two

14	4/21	MJ Chapter Seven, Exception Handling, pages 180 - 209 <i>Hands-On Twelve</i>
14	4/23	Exam Two Answered
15	4/28	HW5 Due MJ Chapter Seven, Exception Handling, pages 180 - 209 [Continuation] <i>Hands-On Twelve</i>
15	4/30	No School: Non-Instructional Day
16	5/5	Projects Due In-Class Presentations
16	5/7	In-Class Presentations (Continuation)
18	5/19	Final Exam

Important dates:

2/4/2020: Last Day to Drop a Class without a "W" grade

2/11/2020: Last Day to Add Courses for Spring 2020.

4/23/2019: Last Day to Withdraw for Spring 2020.