

CS 22A: PYTHON PROGRAMMING FOR NON-MAJORS I

San José State University

Computer Science Department

Section 02, Spring 2019

COURSE AND CONTACT INFORMATION

Instructor: Wendy Lee Ph.D.

Office Location: Duncan Hall 282 (DH 282)

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Office Hours: Thursday 2:00 pm – 3:00 pm

Class Days/Time: Tuesday & Thursday 3:00 pm – 4:15 pm

Classroom: MacQuarrie Hall 225 (MQ 225)

Prerequisites: This course is intended for students who have no prior programming experience and who are interested in 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

This course is an introduction to Python Programming. Programming in interesting, relevant, and practical contexts. Image and video manipulation, digital music, databases, web pages, data analysis in life sciences, other applications. Fundamental programming constructs: data structures and algorithms, iterations, functions. Prerequisite: This course is intended for students who have no prior programming experience. This course is not open to computer science majors or minors, or software engineering majors.

Note: This course is mainly for life science students interested in pursuing a Minor in Bioinformatics. In other words, we will cover Python with a bias towards examples drawn from Biology.

COURSE LEARNING OUTCOME (CLO)

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

1. CLO 1: Explain fundamental programming constructs such as assignments, sequential operations, iterations, conditionals, defining functions, and abstraction.
2. CLO 2: Analyze and explain the behavior of Python programs.
3. CLO 3: Apply fundamental programming constructs in life and physical science contexts.

REQUIRED TEXTS/READINGS

Python for Biologists by Martin Jones, 2015, ISBN-13: 978-1492346135, ISBN-10: 1492346136.

Note: The author is a biologist. This book, as well as *Advanced Python for Biologists*, were written especially for scientists who are new to programming. The author maintains a website for the books at <http://pythonforbiologists.com>. An older version of the book can be found online: <http://userpages.fu-berlin.de/digga/p4b.pdf>.

Note: We will cover the first eight chapters of the book. In other words, we will cover the whole book except for the last chapter.

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 2:59 pm on the following dates:
 - Homework 1 due on Thursday, February 14, 2019.
 - Homework 2 due on Tuesday, March 5, 2019.
 - Homework 3 due on Thursday, March 21, 2019.
 - Homework 4 due on Tuesday, April 9, 2019.
 - Homework 5 due on Tuesday, April 30, 2019.
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. The term-project is due on Tuesday, May 7, 2019. Each group will give a 10-minute, in-class presentation (5 minutes per student) on May 7 or 9, 2019, during class time.
4. **Term Exams (20%):**

Exam One: Tuesday, March 12, 2019.
Exam Two: Tuesday, April 16, 2019.

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 Tuesday, May 21 2:45 pm – 4:00 pm. If there is a time conflict, please inform the instructor at least two weeks in advance for rescheduling.

6. 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, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

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 MQ225:** Lecture/Lab MQ225 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 MQ225 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 MQ225 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 02, SPRING 2019

COURSE SCHEDULE

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

Week	Date	Topics
1	1/24	Syllabus, Introductions, Course Expectations, Python Interpreter and Python Coding Style <i>Hands-On One and Book (MJ) Chapter One</i>
2	1/29	MJ Chapter Two, Printing and Manipulating Text, pages 14 - 28 <i>Hands-On Two</i>
2	1/31	MJ Chapter Two, Printing and Manipulating Text, pages 28 - 36 <i>Hands-On Three</i>
3	2/5	MJ Chapter Two, Printing and Manipulating Text, pages 28 - 36 [Continuation] <i>Hands-On Three</i>
3	2/7	MJ Chapter Three, Reading and Writing Files, pages 54 - 66 <i>Hands-On Four</i>
4	2/12	MJ Chapter Three, Reading and Writing Files, pages 54 - 66 [Continuation] <i>Hands-On Four</i>
4	2/14	Homework #1 due MJ Chapter Four, Lists and Loops, pages 77 - 86 <i>Hands-On Five</i>
5	2/19	Homework #1 answers. MJ Chapter Four, Lists and Loops, pages 86 - 92 <i>Hands-On Six</i>
5	2/21	MJ Chapter Four, Lists and Loops, pages 86 - 92 [Continuation] <i>Hands-On Six</i>
6	2/26	MJ Chapter Five, Writing our own Function, pages 105 - 119 <i>Hands-On Seven</i>
6	2/28	MJ Chapter Five, Writing our own Function, pages 105 - 119 [Continuation] <i>Hands-On Seven</i>
7	3/5	Homework #2 due MJ Chapter Five, Writing our own Function, pages 121 - 122.

Week	Date	Topics
		<i>Hands-On Eight</i>
7	3/7	Homework #2 answers. MJ Chapter Five, Writing our own Function: The BRCA1 and BRCA2 Proteins <i>Hands-On Nine</i>
8	3/12	Term Exam 1
8	3/14	MJ Chapter Six, Conditional Tests, pages 129 – 139 <i>Hands-On Ten</i>
9	3/19	Term Exam 1 answers. MJ Chapter Six, Conditional Tests, pages 129 – 139 [Continuation]. <i>Hands-On Ten</i>
9	3/21	Homework #3 due MJ Chapter Six, Conditional Tests, pages 139 – 141 <i>Hands-On Eleven</i>
10	3/26	Homework #3 answers. MJ Chapter Seven, Conditional Tests, pages 142 – 143 <i>Hands-On Twelve</i>
10	3/28	MJ Chapter Seven, Regular Expressions, pages 151 – 167 <i>Hands-On Thirteen</i>
11	4/2	Spring Recess - no classes
11	4/4	Spring Recess - no classes
12	4/9	Homework #4 due MJ Chapter Seven, Regular Expressions, pages 151 – 167 [Continuation] <i>Hands-On Thirteen</i>
12	4/11	Homework #4 answer. MJ Chapter Seven, Regular Expressions, pages 168 – 169 <i>Hands-On Fourteen</i>
13	4/16	Term Exam 2
13	4/18	MJ Chapter Eight, Dictionaries, pages 179 – 193 <i>Hands-On Fifteen</i>
14	4/23	Term Exam 2 answers.
14	4/25	MJ Chapter Eight, Dictionaries, pages 179 – 193 [Continuation]. <i>Hands-On Fifteen</i>
15	4/30	Homework #5 due MJ Chapter Eight, Dictionaries, page 194 <i>Hands-On Sixteen</i>
15	5/2	Homework #5 answer. General Review
16	5/7	Projects Due. In-Class Presentations
16	5/9	In-Class Presentations [Continuation]
18	5/21	Final Exam – Tuesday 2:45 pm to 4:00 pm

Important dates:

2/2/2019: Payment Due Date.

2/5/2019: Last day to drop courses without an entry on student's permanent record. Last day to drop courses with adjustment of registration fees

2/12/2019: Last day to add courses for Spring 2019.

4/25/2019: Last day to Withdraw for Spring.