CS 22A: PYTHON PROGRAMMING FOR NON-MAJORS I

San José State University
Computer Science Department
Section 01, Fall 2018

COURSE AND CONTACT INFORMATION

Instructor:	Wendy Lee Ph.D.
Office Location:	Duncan Hall 282 (DH 282)
Email:	wendy.lee@sjsu.edu
Office Hours:	Tuesday 11:00 am – 12:00 pm
Class Days/Time:	Tuesday & Thursday 1:30 pm – 2:45 pm
Classroom:	Duncan Hall 450 (DH 450)
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: 1492346135.

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). Any homework not picked up during class time will be left on the shelves near my office door. Assignments are due in the beginning of the lecture on the following dates:

    a. Homework 1 due on Thursday, September 13, 2018. Submit at Canvas by 1:29pm.

    b. Homework 2 due on Tuesday, October 2, 2018. Submit at Canvas by 1:29pm.

    c. Homework 3 due on Thursday, October 18, 2018. Submit at Canvas by 1:29pm.

    d. Homework 4 due on Tuesday, November 6, 2018. Submit at Canvas by 1:29pm.

    e. Homework 5 due on Tuesday, November 27, 2018. Submit at Canvas by 1:29pm.

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 20-minute, in-class presentation (10 minutes per student) on December 4 or 6, 2018, during class time. The term-project is due on Tuesday, December 4, 2018.

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

    Exam One: Tuesday, October 9, 2018.
    Exam Two: Tuesday, November 13, 2018.

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 Thursday, December 13, 2018, from 12:15 pm to 2:30 pm.

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 DH450**: Lecture/Lab DH450 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 DH450 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 DH450 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, FALL 2018

COURSE SCHEDULE

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

Week	Date	Topics
1	8/21	Green Sheet, Introductions, Course Expectations, Python Interpreter and Python Coding Style *Hands-On One and Book (MJ) Chapter One*
1	8/23	MJ Chapter Two, Printing and Manipulating Text, pages 14 - 28 *Hands-On Two*
2	8/28	MJ Chapter Two, Printing and Manipulating Text, pages 14 – 28 [Continuation] *Hands-On Two*
2	8/30	MJ Chapter Two, Printing and Manipulating Text, pages 28 - 36 *Hands-On Three*
3	9/4	MJ Chapter Two, Printing and Manipulating Text, pages 28 - 36 [Continuation] *Hands-On Three*
3	9/6	MJ Chapter Three, Reading and Writing Files, pages 54 - 66 *Hands-On Four*
4	9/11	MJ Chapter Three, Reading and Writing Files, pages 54 – 66 [Continuation] *Hands-On Four*
4	9/13	Homework #1 due. MJ Chapter Four, Lists and Loops, pages 77 - 86 *Hands-On Five*
5	9/18	Homework #1 answers. MJ Chapter Four, Lists and Loops, pages 86 – 92 *Hands-On Six*
5	9/20	MJ Chapter Four, Lists and Loops, pages 86 – 92 [Continuation] *Hands-On Six*
6	9/25	MJ Chapter Five, Writing our own Function, pages 105 - 119 *Hands-On Seven*
6	9/27	MJ Chapter Five, Writing our own Function, pages 105 – 119 [Continuation] *Hands-On Seven*
7	10/2	Homework #2 due. MJ Chapter Five, Writing our own Function, pages 121 – 122. *Hands-On Eight*

Week	Date	Topics
7	10/4	Homework #2 answers. MJ Chapter Five, Writing our own Function: The BRCA1 and BRCA2 Proteins *Hands-On Nine*
8	10/9	**Term Exam 1**
8	10/11	MJ Chapter Six, Conditional Tests, pages 129 – 139 *Hands-On Ten*
9	10/16	Term Exam 1 answers. MJ Chapter Six, Conditional Tests, pages 129 – 139 [Continuation]. *Hands-On Ten*
9	10/18	Homework #3 due. MJ Chapter Six, Conditional Tests, pages 139 – 141 *Hands-On Eleven*
10	10/23	Homework #3 answers. MJ Chapter Seven, Conditional Tests, pages 142 – 143 *Hands-On Twelve*
10	10/25	MJ Chapter Seven, Conditional Tests, pages 142 – 143 [Continuation] *Hands-On Twelve*
11	10/30	MJ Chapter Seven, Regular Expressions, pages 151 – 167 *Hands-On Thirteen*
11	11/1	*MJ Chapter Seven, Regular Expressions, pages 151 – 167 [Continuation]* *Hands-On Thirteen*
12	11/6	Homework #4 due. MJ Chapter Seven, Regular Expressions, pages 168 – 169 *Hands-On Fourteen*
12	11/8	Homework #4 answer. MJ Chapter Seven, Regular Expressions, pages 168 – 169 [Continuation]. *Hands-On Fourteen*
13	11/13	**Term Exam 2**
13	11/15	MJ Chapter Eight, Dictionaries, pages 179 – 193 *Hands-On Fifteen*
14	11/20	Term Exam 2 answers. MJ Chapter Eight, Dictionaries, pages 179 – 193 [Continuation]. *Hands-On Fifteen*
14	11/22	Thanksgiving Day – No Class
15	11/27	Homework #5 due. MJ Chapter Eight, Dictionaries, page 194 *Hands-On Sixteen*
15	11/29	Homework #5 answer. General Review
16	12/4	Projects Due In-Class Presentations
16	12/6	In-Class Presentations [Continuation]
17	12/13	**Final Exam – Thursday 12:15 pm to 2:30 pm**

Important dates:
8/31/2018: Last day to Drop a Class without a "W" grade.
9/10/2018: Last day to Add via MySJSU online without a Petition & Late fee
11/16/2018: Last day to Withdraw.