CS 8 – Solving Problems with Computers I
Syllabus – Spring 2017

Class Time:  Tu & Th 3:30pm – 4:45pm  Location:  Buchanan 1920
Instructor:  Ziad Matni  Email:  zmatni@cs.ucsb.edu
Office Hours:  Tu 10:00 am – 12:00 am in SMSS 4409
Lab Times:  W 3pm, 4pm, 5pm, 6pm in PHELP 3525
Class Main Website:  https://ucsb-cs8-s17.github.io
Class Piazza Site:  https://piazza.com/ucsb/spring2017/cs8

Catalog Description
https://www.cs.ucsb.edu/education/courses/cmpsc-8

Class Overview
Students will learn fundamental principles and concepts of computers and programming, including
structured programming techniques. Students learn to use the Python interpreter and write Python
programs. We will be using Python 3 in this class (don’t use anything older than version 3.4.3).

Computer Science is the study of abstractions and algorithms. In Computer Science, an abstraction is a
useful representation of something from the real world that allows us to work with it more easily or
efficiently. An algorithm is a well-defined, step-by-step sequence of instructions that can be used to
mechanically determine the solution to some well-defined problem. Computers are machines that can
“process” algorithms with the help of code or programs.

Learning how to program requires time, perseverance, and consistent practice: exactly like
practicing a musical instrument, a field sport, or cooking a gourmet meal. There’s a science behind
programming, but it is also about technique – and that requires you to “get your hands dirty” and practice,
practice, and then practice some more! You are bound to make mistakes – and that’s ok because you will
learn from them. Making mistakes means you are learning! Do not be afraid of trying something that
you initially have no clue about! Remember that practicing early and often will make you a better
programmer in the end. This means that you should not procrastinate and wait until the last moment to do
your assignments and homework… but you knew that already, didn’t you!? ;)

What you need to know BEFORE you take this course
Little or no prior exposure to computer science is assumed. This is a beginner class in CS.

What you will learn by the end of this course
You’ll have the opportunity to learn all of these things (though not necessarily in this order):
• The “Why do we care?” question regarding computer science and its role in society.
• Problem solving and abstraction
• Memory concepts: variables, names, types, values, and assignment statements
• Strings of characters
• Control structures (for loops, if/else, while loops)
• Functions
• Processing text files
• Lists and dictionaries
• Program style: How to write code that other people can read and understand

Required Textbook
Python Programming In Context, 2nd Edition
by Bradley N. Miller and David L. Ranum
ISBN-10: 1449699391

Class Format
This is a large lecture class that meets twice a week and is accompanied by a lab. Attending lectures and your lab is mandatory. Attendance will be taken in labs and missing too many will result in the instructor taking off up to a half grade from your final grade (e.g. a B- becomes a C+).

This course has multiple readings, 8-9 homework assignments, 7-8 lab assignments, 2-3 projects, 2 midterms and one final exam. You will submit homework as a hardcopy in class, submit lab and projects assignments online, and do all the exams in the same classroom. It is really important to do the class readings ahead of time. Class participation is vital and highly encouraged (and recognized too!)

Just as in a math classes, everything we do in this class (and almost all classes in CS) builds on all the work that came before. So, everything is cumulative—meaning that you can’t afford to miss any classes unless absolutely necessary. Miss two lectures in a 10-week two-lecture per week course, and you’ve already skipped 10% of the course—it wouldn't be surprising if your performance (i.e. final grade) in the course dipped by a similar amount!

You may find the workload heavy. It may even feel unreasonable compared to your other courses. However, I assure you that it is not unreasonable, given the goal of making you a skilled beginning programmer. Programming is a skill, and the only way to get good at it is lots and lots of practice, which takes lots and lots of time. The usual "folklore" rule of thumb is 8–12 hours per week for a normal college class. That means you should expect, at a minimum to put in 5–9 hours per week on this course, on top of the 3 hours 20 minutes you spend in lecture and lab each week.
Lectures
The purpose of the lectures in this course is to guide you through the readings, homework, and labs:

• To provide an overview of how everything fits together.
• To provide hands-on demonstrations of Python programming and other things that you’ll do on your own later.
• To provide additional information that is not in the textbook (and to sometimes clarify the textbook).
• To provide an opportunity to ask questions, and hear answers to questions asked by others.

This course moves quickly. So attendance is very important.
The last day of class is Thursday, 6/8.

Homework
In every Thursday class, you'll be given a homework assignment that is due in the following Thursday class. There may be exceptions around or before exams.

These are typically pencil/paper type problems, though sometimes you'll need access to a computer to solve them. If you don't have reliable access to a computer at home (or in your dorm), please plan your schedule so that you can spend time in the CSIL computer lab between classes.

Homework assignments are completed on paper—they may NOT be submitted electronically—and may ONLY be submitted in person, in the class in which they are due.

You may NOT turn in a homework assignment "on behalf of" an absent classmate, or have someone else turn in your homework for you—doing so in this course is a form of academic dishonesty. You can work with a “homework-buddy”, but you each have to turn in your own work and you have to disclose who you worked with (there’s a place to do that on the homework form).

Again, please do NOT:

• Turn in homework on a day other than when it is due. No late submissions accepted.
• Have someone else turn in your homework for you (that will be considered academic dishonesty).
• Leave homework in a mailbox or slide it under a door.
• Email your homework or upload it anywhere online.
• Copy answers directly from other students or (heaven forbid!) website. Do your own work!
• Forget to cite (i.e. give credit to) your sources, if you consult your textbook, a website, or person.
Labs

The labs meet at PHELP 3525 and are run by the T.As. Attendance is taken and mandatory.

Please do not switch your registered lab sections before clearing it with all TAs involved (space is tight in these labs). You will likely have to switch sections with someone in order to get this to happen.

You will be given lab assignments every week. You typically will start these in the lab and finish them in the lab, but you can use up to 2 extra days on your own time afterwards. After that, the labs are considered late (see my late policy). The lab assignments have to be turned in by end-of-day (i.e. 11:59 PM) Friday, by uploading them using the Turnin service. You can ONLY turn in your lab assignments on Turnin.

In some labs, you will be asked to pair up and work with one other partner in the lab. This “pair programming” concept is explained further in another section in this syllabus.

Again, please do NOT:

- Use anything other than Turnin to submit your lab.
- Turn in labs late. They are due by end-of-day (i.e. 11:59 PM) Friday (except when indicated otherwise).
- Copy answers directly from other students or websites. Do your own work!
- Forget to cite (i.e. give credit to) your sources, if you consult your textbook, a website, or person.

Projects

You will be given 2-3 programming projects to do. These will be done in groups of 2 (i.e. pair programming) and will involve slightly more complex and inventive programming than your labs. You will be given at least 2 weeks to complete each of these projects. More detailed information will be given in class by the instructor. Projects, like labs, will be submitted using Turnin.

Exams

Both the midterm exams and the final exam are closed book. You may bring one 8.5” x 11” sheet of paper for notes (single sided for midterms; double sided for final), but you have to surrender your note page with your exam. The final exam is cumulative.

The following dates are set for the 3 exams and will not change. If you miss any of them, you will get an F in the class:

- Midterm Exam #1 Tuesday, 4/25 during regular class time
- Midterm Exam #2 Tuesday, 5/18 during regular class time
- Final Exam Thursday, 6/15 from 4:00 pm – 7:00 pm
Make Up Policy

If you miss a class, you miss the opportunity for the points on that in-class assignment, or homework that was due. Period. Generally speaking, I do not allow for makeups in this class, with few exceptions.

**There is no makeup for homework or lab assignments**, except for excused absences arranged and agreed to by the instructor *in advance*. If you don’t turn in an assignment by the due date and time, you will get a **zero grade** for that assignment. *Nonetheless, I will drop the 2 lowest homework grades at the end of the quarter.*

**There is no makeup for exams.** This is a stricter policy than with assignments. The midterms and the final exam dates are announced in this syllabus and are fixed. If you believe you cannot attend any of these dates, especially the final exam, please consider dropping the class.

In rare cases, if there is a documented family emergency, documented extended illness, documented required court appearance, or other situation beyond the students' control (*with documentation*) the instructor may grant additional make up days entirely at the instructor's discretion—but this is **not** a guarantee or a right. Asking for accommodation because “I already bought my plane ticket” or “I have out of town guests that week” is a futile exercise that will get you nowhere…

Late Submission Policy

Late submission means within **24 hours after deadline (for homework)**. *Anything submitted beyond that is graded with a zero.* Late submissions will result in a **20% penalty**. Recall: homework is due at the **start of class** and you can **only** submit homework in class.

Late submissions of lab and project assignments are **NOT GUARANTEED TO BE GRADED!** At the very least, they will also result in a **20% penalty**.

**In summary**: homework is due every Thursday in class; if you turn one in on Friday before 3:30 PM, you’ll get a 20% grade penalty. After that, it’s a zero grade.
Labs are due on Friday via Turnin; if you turn them in on Saturday before 11:59 PM, you’ll get a 20% penalty. After that, it’s a zero grade. The same policy applies to projects and their due dates.

The Use of Laptops and Smartphones in Class

*In lecture*
Using laptops/tablets in class is a controversial topic these days. As with all technology, they amplify the virtues and vices already present in society. I will allow students to use laptops/tablets in class to take notes, to participate in online activities, and to submit short writing assignments. However, I am extremely aware of the distractions afforded by laptops/tablets.

If I notice your laptop/tablet activities are completely off-task and distracting to students around you, **you will be asked to leave class and the class will be counted as an unexcused absence**. In general, I expect that you will all behave like the adults that you are, recognize that you are paying for the course you are taking, and treat that time with the respect it deserves.

I do not allow the use of cell phones in class. Please turn them off or put them on vibrate mode before you enter the classroom. If your phone causes a distraction in class, or if I (or one of the TAs) notice you...
using your phone in class, **you will be asked to leave class and the class will be counted as an unexcused absence.** Additionally, I reserve the right to ban laptops from lecture at any given time if I sense that they detract from the learning outcomes described for the class.

**About Pair Programming**

Some (but not all) of the programming work in this course will be done using a style of programming known as **“pair programming”**. This is where two people work together at the same terminal, as “lab partners”, to solve a programming problem.

For the assignments where pair programming is used, it is required, not optional. Here’s why:

- Pair programming is a real-world skill that is highly valued by employers.
  - Many companies use pair programming extensively, including several local area employers of UCSB CS graduates.
- Companies that employ UCSB CS and CE grads tell us that our graduates have good technical skills but need better skills and working in pairs and groups to solve problems.
  - Incorporating pair programming into our curriculum is part of our response to this “real-world” feedback.
- Most students find it helpful and enjoyable—UCSB CS students that were surveyed about their pair programming experiences overwhelmingly reported positive results.
- There is also evidence in the scientific literature that it improves student learning, and helps you get better grades.

To learn more about pair programming, watch the following video (it takes less than 10 minutes).


We also realize that working in groups has another, potentially less positive, side to it: namely the problem of “freeloaders”. So, please:

- Do NOT “just copy” homework or code from others and claim it as your own work. That is called plagiarism and is subject to harsh consequences from the instructor, the department, and the university.
- Do NOT work together on assignments **unless you’ve been specifically told that it is allowed**.

The bottom line:

- The instructor will try to be very specific about what kinds of collaboration are permitted, and what kinds of collaboration are not permitted, and are considered a form of academic dishonesty.
- If you are not sure about whether some kind of collaboration is permitted or not, or if dishonesty is taking place, **it is your responsibility to ask questions.**
Grading

Your participation in class is always noted – those who make interesting contributions in class can expect to receive some extra credit.

<table>
<thead>
<tr>
<th>Item</th>
<th>Grade %</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>15%</td>
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<tr>
<td>Labs and Projects</td>
<td>25%</td>
</tr>
<tr>
<td>Midterms (2 exams)</td>
<td>40%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100 %</strong></td>
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Class Grade Distributions

These are calculated to 2 decimal places and strictly assigned.

<table>
<thead>
<tr>
<th>Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>[93 – 100]</td>
<td>A</td>
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<tr>
<td>[90 – 93]</td>
<td>A-</td>
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<tr>
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<td>[70 – 73)</td>
<td>C-</td>
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<tr>
<td>[60 – 70)</td>
<td>D</td>
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<tr>
<td>&lt; 60</td>
<td>F</td>
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</tbody>
</table>

[X – Y) means “X to Y inclusive of X (but not Y)”

A+ grades: These may be awarded to the very best performing students in the class—but the cutoff for A+ grades will be determined at the end of the course at the discretion of the instructor (there is no pre-determined cutoff—an average of 97 or more doesn't guarantee you an A+ grade.) If I decide to curve the grade (it’s not guaranteed that I will), I will do so on the final class scores and not on any individual item.

CS8 (Spring 2017) TEACHING ASSISTANTS

The teaching assistants (TAs) aid the instructor in multiple ways and are responsible to lead the labs, do the grading, proctor classes and exams, and help out students through their office hours. The TA office hours will be held in Trailer 936.

<table>
<thead>
<tr>
<th>TA NAME</th>
<th>LAB SECTION</th>
<th>OFFICE HOURS</th>
<th>EMAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahnaz Koupaee</td>
<td>Wed. 3 pm</td>
<td>Wed. 10 am – 12 pm</td>
<td><a href="mailto:koupaee@umail.ucsb.edu">koupaee@umail.ucsb.edu</a></td>
</tr>
<tr>
<td>Sourav Medya</td>
<td>Wed. 4 pm, 5 pm</td>
<td>Tue. 5 pm – 7 pm</td>
<td><a href="mailto:medya@umail.ucsb.edu">medya@umail.ucsb.edu</a></td>
</tr>
<tr>
<td>Shiyu Ji</td>
<td>Wed. 6 pm</td>
<td>Mon. 3 pm – 5 pm</td>
<td><a href="mailto:shiyu@umail.ucsb.edu">shiyu@umail.ucsb.edu</a></td>
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<tr>
<td>Zhongqi Yi (Grader)</td>
<td>-</td>
<td>-</td>
<td><a href="mailto:zhongqi_yi@umail.ucsb.edu">zhongqi_yi@umail.ucsb.edu</a></td>
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</table>
UCSB Policies on Academic Integrity and Honesty
I adhere strictly to the University’s academic integrity policy. Please cite other people’s work if you are going to refer to it in any of your work.

It is expected that students attending the University of California understand and subscribe to the ideal of academic integrity, and are willing to bear individual responsibility for their work. Any work (written or otherwise) submitted to fulfill an academic requirement must represent a student’s original work. Any act of academic dishonesty, such as cheating or plagiarism, will subject a person to University disciplinary action. Using or attempting to use materials, information, study aids, or commercial “research” services not authorized by the instructor of the course constitutes cheating. Representing the words, ideas, or concepts of another person without appropriate attribution is plagiarism. Whenever another person’s written work is utilized, whether it is a single phrase or longer, quotation marks must be used and sources cited. Paraphrasing another’s work, i.e., borrowing the ideas or concepts and putting them into one’s “own” words, must also be acknowledged. Although a person’s state of mind and intention will be considered in determining the University response to an act of academic dishonesty, this in no way lessens the responsibility of the student.
(Section A.2 from: http://www.sa.ucsb.edu/Regulations/student_conduct.aspx, Student Conduct, General Standards of Conduct)

Disabled Students Program (DSP)
UCSB provides academic accommodations to students with disabilities. Students with disabilities are responsible for ensuring that the Disabled Students Program (DSP) is aware of their disabilities and for providing DSP with appropriate documentation. DSP is located at 2120 Student Resource Building and serves as the campus liaison regarding issues and regulations related to students with disabilities. The DSP staff works in an advisory capacity with a variety of campus departments to ensure that equal access is provided to all disabled students.

If you have a disability that requires accommodation in this class, please go see the DSP very early on in the quarter. I will only honor these types of requests for accommodation via the DSP.
More information about the DSP is found here: http://dsp.sa.ucsb.edu
**Class Schedule**

_The lecture topics are subject to change or re-arrangement._

<table>
<thead>
<tr>
<th>W #</th>
<th>L #</th>
<th>Date</th>
<th>Topics</th>
<th>Textbook Readings</th>
<th>H.work Due</th>
<th>Lab Due (on Friday)</th>
<th>Project Due</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>4/4</td>
<td>Intro to the class</td>
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<tr>
<td>2</td>
<td>4/6</td>
<td></td>
<td>Introduction to Computer Science</td>
<td>Ch. 1.1 – 1.4</td>
<td>HW 0</td>
<td>LAB 0</td>
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<tr>
<td>2</td>
<td>3</td>
<td>4/11</td>
<td>Basic concepts in Computer Science</td>
<td>Ch. 1.1 – 1.4</td>
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<tr>
<td>4</td>
<td>4/13</td>
<td></td>
<td>Introduction to Python</td>
<td>Ch. 1.5 – 1.6</td>
<td>HW 1</td>
<td>LAB 1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>4/18</td>
<td>Mathematical expressions 1</td>
<td>Ch. 2.1 – 2.4</td>
<td></td>
<td></td>
<td>PR 1</td>
</tr>
<tr>
<td>6</td>
<td>4/20</td>
<td></td>
<td>Mathematical expressions 2</td>
<td>Ch. 2.5 – 2.7</td>
<td>HW 2</td>
<td>LAB 2</td>
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<tr>
<td>4</td>
<td>4/25</td>
<td></td>
<td>MIDTERM 1 (lessons 1 thru 6)</td>
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<tr>
<td>7</td>
<td>4/27</td>
<td></td>
<td>String types, methods, operators</td>
<td>Ch. 3.1 – 3.2</td>
<td>HW 3</td>
<td>LAB 3</td>
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<tr>
<td>5</td>
<td>5/2</td>
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<td>Encoding and decoding strings</td>
<td>Ch. 3.3 – 3.7</td>
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<tr>
<td>9</td>
<td>5/4</td>
<td></td>
<td>Python lists</td>
<td>Ch. 4.1 – 4.4</td>
<td>HW 4</td>
<td>LAB 4</td>
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<td>6</td>
<td>5/9</td>
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<td>Python dictionaries</td>
<td>Ch. 4.5 – 4.7</td>
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<td>PR 2</td>
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<td>11</td>
<td>5/11</td>
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<td>Text files as input/output</td>
<td>Ch. 5.1 – 5.2</td>
<td>HW 5</td>
<td>LAB 5</td>
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<td>7</td>
<td>5/16</td>
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<td>Loops and Boolean expressions</td>
<td>Ch. 5.3 – 5.4</td>
<td>HW 6N1</td>
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<td>5/18</td>
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<td>MIDTERM 2 (lessons 7 thru 12)</td>
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<td>8</td>
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<td>Digital image use in Python</td>
<td>Ch. 6.1 – 6.2</td>
<td>LAB 6N2</td>
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<td>Functions in Python 1</td>
<td>Ch. 6.3 – 6.4</td>
<td>HW 7</td>
<td>LAB 7</td>
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<td>9</td>
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<td>Functions in Python 2</td>
<td>Ch. 6.3 – 6.4</td>
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<td>16</td>
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<td>HW 8</td>
<td>LAB 8</td>
<td>PR 3</td>
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<tr>
<td>18</td>
<td>6/8</td>
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<td>Review for Final Exam</td>
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</tbody>
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**Thursday, June 15th, 4:00 – 7:00 PM**

**FINAL EXAM (cumulative)**

Notes:

N1: Homework 6 is due on Tuesday, 5/16.
N2: Lab 6 is due on Monday, 5/23

Please note the following:

- Students must submit all homework in printed form **by start of class** per the schedule (except for Homework 6 – see above note).
- Students must submit lab assignments on **Turnin** by that week’s **end-of-day Friday** (except for Lab 6 – see above note).
- Students must submit project assignments on **Turnin** per the schedule.
- The midterms will be taken in class, at the start of class (so don’t be late!), and will take up the entire class period. Midterm dates are fixed and will not change.
- The final exam is set by the university. Instructors have no control over setting final exams dates and times.