CMPSCI 119
Spring 2020
Introduction to Programming with Python

Professor William T. Verts

Class:
Lectures: Monday, Wednesday, Friday 1:25PM–2:15PM, Goessmann 20.

Office Hours and Email:
LGRC A357, Office Hours M/W/F 2:45-3:45, and by appointment.
`verts@cs.umass.edu`   Personal, for asking questions.   Put CMPSCI 119 in the subject line.
`literacy@cs.umass.edu`   For submitting on-line materials.
I read all email daily, but do not expect a speedy reply. I might not reply at all if the question is something I can address in class. Do NOT email attachments to me; they will be deleted. Do not call me at home.

TA: The TAs will hold office hours in LGRT 222, perform the grading, and be available to assist in all aspects of this course. Hours to be arranged. TA office is shared by all TAs and graders for all my courses. Head TA for 119 is Pinar Ozisik (`pinar@cs.umass.edu`); you can ask her any questions about the course.

Book: *Computer Science Companion*, 4TH Edition, 2019 Printing, ISBN 9781524992613, ~$28, by me. There are many Python references on-line and available at local bookstores; I'll provide references when appropriate, but purchase is not mandatory. Note: The *Computer Science Companion* is a required text for COMPSCI 105, 119, 120, and 145.

Web: `http://people.cs.umass.edu/~verts` (then follow the link to the 119 page), or:
`http://people.cs.umass.edu/~verts/cmpsci119/cmpsci119.html`
`http://people.cs.umass.edu/~verts/cmpsci119/quizzes/quizzes.html`

Social Media:
Please do not "friend" me on Facebook, Linked-In, or other social networks. I reserve Facebook for relatives, hiking buddies, and friends from high school.

Course Scoring (percentages may change according to number and type of assignment):
Midterm 1	15%	mid-February. Open book, open notes.
Midterm 2	15%	late March to early April. Open book, open notes.
Final Exam	20%	Monday, May 4, 10:30am, ~~Goessmann 20~~ **Marcus 131**. Open book, open notes.
Homework	10%	Throughout semester (assigned on-line homework, in-class exercises, etc.)
Projects:	40%	Throughout semester. Late penalties will apply as appropriate.

Letter grades will be assigned according to final computed course score:
A ≥ 90%, A- ≥ 88%, B+ ≥ 86%, B ≥ 80%, B- ≥ 78%, C+ ≥ 76%, C ≥ 64%, C- ≥ 62%, D+ ≥ 60%, D ≥ 50%, F < 50%. Missing either of the midterms, or the final exam, incurs an automatic F for the course. Fractional final course scores are ⌈ceilinged⌉ up to an integer.

Python on Your Computer: You may use either a Windows PC or an Apple Macintosh. The programming environment we use is Python 3 under IDLE. There are versions that run on both PCs and Macs. Download and install the appropriate Python and IDLE environment from **`http://www.python.org/`** (Mac users also have an older version of Python already installed, accessible from the Terminal application, but we won't be using that).

Server-Side Python:
We *may* also run Python programs on a UNIX server, but at this time doing so is not certain. Accessing the server will require a UNIX account (which I will give you). It also will require special free software that I will tell you about at the appropriate time.

Course Expectations:

I expect that few students coming in to COMPSCI 119 have any experience in writing computer programs (in any language). Some do, and that's cool, but I am assuming that students have no relevant experience. At the end of the course, however, I expect students to be given any reasonable problem description and then write a Python program that solves that problem. The resulting program does not have to be the most efficient or well-written, but it must run to completion without crashing. Students must be able to modify an existing program to do new tasks and must be able to find and correct errors in that program.

Note that this course will require a substantial amount of work from and a serious commitment on the part of each student, and some students may spend many hours writing, debugging, and running their programs before those programs are ready to be turned in and graded. Partial, incomplete, or broken programs don't count: a program that crashes isn't ready to be turned in.

Course Outline:

Here is a general sense of the topics we will cover:

1. Basic data types (`int`, `float`, `bool`, `complex`) and variables,
2. Python from the command line,
3. Flowcharts and program structure,
4. Simple sequential Python programs, assignment, and the `input` and `print` statements,
5. Predefined functions and parameter passing, `import` of predefined libraries,
6. Type conversion functions (`str`, `int`, `float`, etc.),
7. The `if` (`if`, `if-else`, `if-elif-else`) and `while` statements, and how they differ, and indentation,
8. Interactive loops, error checking, and exception handling (`try-except` and `try-finally`),
9. User-defined functions (the `def` and `return` statements), parameter passing, custom library modules,
10. Intermediate statements (`pass`, nested functions, `global` variables, etc.),
11. Advanced data types (lists, tuples, strings, and eventually dictionaries), string and list slicing, byte arrays,
12. Advanced techniques for building lists (`range`, list comprehensions, multiplication),
13. Advanced control structures (`for`, `lambda`, passing functions as parameters, `break`, `continue`),
14. File access (reading and writing text files and binary files),
15. Image and sound creation (`.WAV` and `.BMP` files, sine waves, DTMF tones, colors, lines, circles, etc.),
16. Approaches to program design, evaluating alternative data structures and design techniques,
17. Debugging, debugging, debugging, (oh, and did I mention debugging?),
18. Really advanced topics (recursion, object-oriented Python), if there is time.

Final Notes:

1. **DO YOUR OWN WORK, INCLUDING HOMEWORK AND LAB WORK.** You may discuss homework and lab assignments with other students, but you may not share files or code. Upon discovery of duplication, I will contact you for a conference, as required in the guidelines set out by the University of Massachusetts Academic Honesty Policy, and we will resolve the issue according to those guidelines. See:

   http://www.umass.edu/dean_students/academic_policy/
   https://www.umass.edu/honesty/
   https://people.cs.umass.edu/~verts/class_documents/AcademicHonestyPolicy.html

2. Students who are registered through Disability Services should arrange for accommodations as soon as possible. See:

   http://www.umass.edu/disability/
   https://people.cs.umass.edu/~verts/class_documents/DisabilityStatement.html

3. **Do not** ask for extra work after the end of the semester to boost an undesirable grade. It is unfair to other students in the class and I never grant such requests.

4. Please contact me directly if you have any concerns about the running of the course, the TAs, grading, etc.