CMPSCI 119
Fall 2017
Introduction to Programming with Python

Professor William T. Verts

Class Lectures:

Monday, Wednesday, Friday 1:25PM–2:15PM, ILC S131. I will miss Friday, December 1 due to an all-day faculty retreat, a TA will hold a quiz or other in-class exercise.

Office Hours and Email:

LGRC A357, M/W/F 2:30-3:30, and by appointment. I must miss hours on Sept. 8, Oct. 16 & 23, and Dec. 1.

`verts@cs.umass.edu` Personal, for asking questions. Put CMPSCI 119 in the subject line.

`literacy@cs.umass.edu` For submitting on-line materials. Put CMPSCI 119 in the subject line.

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.

Books: **REQUIRED:** ***Computer Science Companion***, REVISED 3RD Edition, 2017 Printing, ISBN 9781524943998, ~$28, by me. (It is OK if you have the unrevised 3RD edition from last year, but the revised version has new information, errors have been corrected, and it is now in color.) The ***Computer Science Companion*** is a required text for COMPSCI 105, 119, 120, and 145.

OPTIONAL: ***Introduction to Computing and Programming in Python – A Multimedia Approach***, 4TH Edition Mark Guzdial & Barbara Ericson, 2015, ISBN 978-0-1340-2554-4, $97, Pearson (Prentice Hall).

Web: `http://people.cs.umass.edu/~verts`
`http://people.cs.umass.edu/~verts/cmpsci119/cmpsci119.html`
`http://people.cs.umass.edu/~verts/cmpsci119/quizzes/quizzes.html`

Twitter and other 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. I do not often post messages on Twitter.

Course Scoring (percentages may change according to number and type of assignment):

Midterm 1	15%	Tuesday, October 10TH, in-class. Open book, open notes.
Midterm 2	15%	Friday, November 3RD, in-class. Open book, open notes.
Final Exam	20%	Thursday, December 14TH, 1:00PM-3:00PM, Goessmann 20. Open book, open notes.
Projects:	40%	Throughout semester. Late penalties will apply as appropriate.
Homework	10%	Occasional (assigned homework, in-class exercises, on-line homework, etc.)

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 any exam incurs an automatic F for the course. Fractional final course scores are rounded to the nearest integer. For example, 87.49999 rounds down to 87 (B+), while 87.50000 rounds up to 88 (A-).

Computer: You may use either a Windows PC or an Apple Macintosh. The programming environment we use is JES 5.0 (Jython Environment for Students), located at `https://github.com/gatech-csl/jes/releases` for free download. There are versions that run on both PCs and Macs. In addition, "standard" versions of Python may be downloaded from `http://www.python.org/`, and Mac users have Python already installed, accessible from the Terminal application. From time-to-time I will demonstrate software that runs only on a Windows PC; Mac users may wish to install Parallels and Windows 7, or Crossover Mac, in order to run these programs.

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 disks. 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 the document at:
   `http://www.umass.edu/dean_students/academic_policy/`

2. **Do not** ask for extra work after the end of the semester to boost an undesirable grade. I never grant such requests.

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

Day-By-Day Schedule (Very Tentative):

	Monday	Wednesday	Friday
1	**September 4 – Labor Day Holiday**	**September 6** – First Lecture –What is programming all about? *(It's mostly debugging!)*	**September 8** – Data, data types. Interactive Python. *Debugging.*
2	**September 11** – Easy programs. `def`, `return`, `print`, and `raw_input`. *Debugging.*	**September 13** – Python `if` statements. The `pass` statement. *Debugging.*	**September 15** – More on `def`, parameter passing. Python `while` statement. *Debugging.*
3	**September 18** – Lists, tuples, and strings, more on functions. JES I/O functions. *Debugging.*	**September 20** – `while` loops with lists and ranges, `for` loops with ranges. *Still debugging.*	**September 22** – List comprehensions to create custom ranges. Writing to simple text files. *Debugging.*
4	**September 25** – Introduction to graphics. Canvases and pixels. *Debugging.*	**September 27 –** Graphics a la JES. Lines, rectangles, ovals, circles, color. Plotting text. *Debugging.*	**September 29** – More on Color. Time delays. Creation of movies. *Debugging.*
5	**October 2** – Intro to image processing. Image processing on one pixel at a time. *Debugging.*	**October 4** – Random numbers. Sierpinski Gasket. *Debugging.*	**October 6** – Review for midterm.
6	**October 10 (TUESDAY) – MIDTERM #1**	**October 11** – Command-line programming. Boolean & character functions. *Debugging.*	**October 13** – Image filtering. Image mirroring and flipping. *Debugging.*
7	**October 16** – Passing functions as parameters in Python. *Debugging.*	**October 18** – 3x3 filters (blur, edge detect, etc.). *Haven't we finished debugging yet?*	**October 20** – Dithering and rotation of images. *Debugging.*
8	**October 23** – Hierarchical decomposition. Nested functions. Sprites in 2D. *Debugging.*	**October 25** – More on nested functions. Recursion. Complex Math. *Debugging.*	**October 27** – String slicing and dictionaries in Python. *Debugging.*
9	**October 30 –** Global variables. Writing text files redux. HTML & SVG files. *Debugging.*	**November 1 –** Review for midterm.	**November 3 – MIDTERM #2**
10	**November 6** – Linear blending in 2D and 3D. *Debugging geometry functions.*	**November 8** – More on interpolation: blending lines and colors. *Debugging graphics.*	**November 10 –** Blending parabolas and cubics. *Debugging.*
11	**November 13 –** Introduction to 3D orthographic projections. *Debugging.*	**November 15 –** 3D Lines and Polygons, image scaling. Hierarchical decomposition in 3D. *Debugging.*	**November 17** – Introduction to the Sunrise Project, creating movies. *Debugging animations.*
12	**November 20 – Thanksgiving Holiday**	**November 22 – Thanksgiving Holiday**	**November 24 – Thanksgiving Holiday**
13	**November 27** – 3D/4D/5D to 2D Projections. Thinking in higher dimensions.	**November 29 –** Polygon fill.	**December 1** – I must be away this day. Special Topics handled by a TA.
14	**December 4 –** Theory of sounds. *Debugging.*	**December 6 –** Python for scientific computing. Polynomials. Python from UNIX. *Debugging.*	**December 8** – Catch-up Day. Showing student Sunrise projects. *No more debugging!*
15	**December 11** – Last Day of Class. Review for Final Exam.	**December 14 – FINAL EXAM 1:00PM-3:00PM, Goessmann 20**	