Course Details
Class Meetings: IES, Room 110); Tu/Th 1:00–2:15 p.m.
Office Hours: Tentatively Tues. & Wed. 9:20–10:10 a.m. Changes will be posted on my webpage.
Computer Lab: Tues. or Wed., Time & Location TBA
FINAL EXAM:
- when: Friday, December 16, 1:00–3:00 p.m.


Instructor Coordinates
Aaron Lauve
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Contact
Communication via Piazza is strongly encouraged. Emails to me should include 215 in the subject line. I will make every effort to reply within 48 hours.

Course Web Page(s)
Section-specific course materials and announcements will be posted to one of:
- piazza.com (a discussion forum that will be used extensively; get the mobile App!)
- cloud.sagemath.com (a site for coding homework and oh-so-much more)
- sakai.luc.edu/portal/site/MATH_215_001_3484_1166 (mainly for grades and accessing Piazza)

Additional Resources
There are many provided by Loyola, and still more that one can uncover on the internet.
- Harrington | Doty – Some locally produced course notes
- Me – I don’t bite! and better, I am uniquely aware of what will be on each exam and quiz
- Math Club Tutoring – time and location to be announced
- Official Python Tutorial – Not a beginners guide to programming
- Beginners’ Guides – Collected by Python
- Coursera | Google – Some online courses
- xkcd – Because we all need a mental break from time to time

Important Dates
There will be a quiz on course material roughly every two weeks. Scheduled dates will be announced on Piazza at least one class period in advance.

| Fall Break | Mar. 10,11 | Drop-Date (“W”) | Nov. 4 |
| Thanksgiving | Nov. 23–25 | Final Exam | Dec. 17 |

Requests to reschedule your final exam must be made through your Dean’s office.
Course Catalog & Syllabus

Course Catalog. Math 215 (3 units): *This is an introductory programming course for students interested in mathematics and scientific computing.* Students will program primarily in a general object-oriented language such as Python, with supplementary exercises in a computer algebra system. Examples will be drawn primarily from applications of calculus, elementary number theory, and cryptography. Prereq. MATH 162 or MATH 132 or permission of instructor.

Syllabus. We will cover most of Chapters 1–11 in the text: lists, functions, dictionaries, control flow statements (if/then/for/while), functional programming, objects, classes. Likely I will draw examples from more than calculus, number theory and cryptography, e.g., genomic data science, social network analysis, web/data scrubbing, ...  

Technology

Insofar as possible, we will be using python3 as served up by jupyter notebooks within SageMathCloud. On occasion, it may be easier to use it on a laptop or a Loyola classroom machine. Consider installing it on your own machine.

Disability Services

The Americans with Disabilities Act (ADA) is a federal statute that provides comprehensive civil rights protection for persons with disabilities. It requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please contact the SSWD office: in the Sullivan Center, suite 117, phone 773.508.3700, fax 773.508.3810, or online at www.luc.edu/sswd/. 
Course Components

HOMEWORK (20%). Due Thursdays by 4:30 p.m., including September 1st. Your lowest score will be dropped in computing your final grade.

PROJECT (30%). You will design and implement a program (of sufficient complexity) to achieve a (sufficiently interesting and desireable) outcome. You will give a 30 minute presentation on this project during class on one of the final weeks of the semester. More details forthcoming; proposal due Oct. 20.

QUIZZES (30%). We will have a quiz every two weeks on the course material. Your lowest scores will be dropped in computing your final grade.

FINAL EXAM (20%). The final exam will be cumulative.

Course Grade

Final grades will be assigned as follows (all numbers are in %):

- A (92)
- A- (90)
- B+ (88)
- B (82)
- B- (80)
- C+ (78)
- C (72)
- C- (70)
- D+ (68)
- D (60)

Course Etiquette

Please set your cell phones to “silent” upon entering class; phone noises are a distraction to everyone. We all need a mental break from time to time—your instructor sympathizes, believe me—but excessive web surfing or phone use during class is downright impolite and a distraction to your instructor; he may ask you to cut it out. Ditto for talking non–math/cs with your neighbor.

Finally, and most importantly, respect for others is stressed above all else; please allow me the first chance to answer your fellow students’ questions. I expect everybody to participate in class discussions, but that begins by fostering an environment where we do not hesitate to ask our questions.

Academic Integrity

The Academic Standards and Regulations web page [www.luc.edu/academics/catalog/undergrad/reg.shtml](http://www.luc.edu/academics/catalog/undergrad/reg.shtml) outlines the definition and ramifications of cheating at Loyola University as well as the recourses available to you should you be accused of cheating. By attending this course, you agree to uphold the high standards of Loyola. If you are found cheating on an assignment or quiz, you will receive a zero (0) and the incident will be reported to your academic dean and recorded in your permanent file.

Odds and Ends

MAKE-UP QUIZZES/EXAMS. Make-up quizzes and exams will only be given for real emergencies, documented illnesses, or university-sponsored events. Students must notify me of their absence no later than the next regularly scheduled class. Failure to appear for a make-up at the arranged time, contact me as stated above, or sufficiently document the circumstances of absence will result in a zero.

CONTACT. Please check your Loyola email periodically and configure Piazza to alert you of activity.

MORE MATH. The department maintains a BLOG ([blogs.luc.edu/mathstats](http://blogs.luc.edu/mathstats)) and a FACEBOOK page ([www.facebook.com/lucmathstats](http://www.facebook.com/lucmathstats)) that will contain interesting math/stats related tidbits throughout the semester. Feel free to join the conversation. (Indeed, if there is a topic that you’d like to see discussed, send an email to webadmin@math.luc.edu and we’ll try to get a post up about it.)

EXTRA CREDIT: If you find study resources or popular articles that you think fellow students would appreciate, please feel free to share it on our Piazza course page or on the department’s facebook page. (If you do, and you tell me about it, and I like what I see, I’ll increase one homework score by one point. Repeatable a maximum of ten times.)
I. Coding Exercises.

Create a jupyter notebook called hw01.ipynb and delimit each part of this exercise with a markdown box, each with appropriate heading.

(a) **Mimicking Stavely’s Example 1.3.** I have placed a file called observations in your personal directory. It’s not quite formatted like the one he describes. *Don’t modify it!* Use a python3 script to determine the average temperature over the month.

(b) **Extending Stavely’s Example 1.3.** Start learning how to plot in python:

- Browse this page: matplotlib.org/users/pyplot_tutorial.html
- plot the data you read from observations using pyplot. *(You should first modify the code used in Part (a) so that as you read each line of observations, you produce two lists of data—say D and T, representing the day(#) and temperature(°F), respectively.)*
- add the line $T = 50 + \frac{1}{3}t$ to the plot. The code below should offer a big enough hint.

```python
import numpy as np
import matplotlib.pyplot as plt

# evenly sampled time at 200ms intervals
X = np.arange(0., 5., 0.2)
y1 = np.arange(1., 41., 1.6)
y2 = [x**2 + 1 for x in X]

# red circles, green dashes, blue line
plt.plot(X, y1, "ro", X, y2, "g--", X, X*20-8, "b")
```

(c) **Play around.** In the same hw01.ipynb notebook, try out some of the operations on data types that I didn’t demonstrate during class. Make mistakes, etc.

II. Math.

Submit these as scanned handwritten notes, as LaTeX, as markdown text in the same hw01.ipynb, etc. Just get it into your homework assignment directory by Thursday’s deadline.

(a) Solve Exercise 2.3

(b) Did you plot the best-fit line in Part I(b)?