PIC 16
Python with Applications

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UCLA Mathematics

Course Content

This course will cover the following topics:

1. Basics
2. Regular Expressions
3. Visualizations
4. Image Processing
5. Data Analysis
6. Symbolic Math
7. GUI
8. Machine Learning
9. Networking

General Plan for course

- **Classes in PIC LAB (MS 2000)**
- Homework and lecture slides: https://ccle.ucla.edu
- Schedule and reading material:

https://www.math.ucla.edu/~hangjie/teaching/Winter2019PIC16/

- Grades will be posted on MyUCLA
- Piazza forum:
  - You can access Piazza through CCLE course website
- Discussion sections go over practice problems and coding help.
- The PIC lab (MS 2000) is a good place to do your homework. http://www.pic.ucla.edu
- Online resources: https://docs.python.org/2/tutorial/

Piazza forum

- Piazza is a discussion forum which we will be using for this class.
- You should be able to sign up using the link
  piazza.com/ucla/winter2019/19wcomptng161
- You can ask questions, either as yourself or anonymously. I highly encourage you to also try answering others' questions.
- Your participation in Piazza contribute positively towards your final grade when your grade is in the borderline of a better letter grade.
- The TAs and I will monitor the discussion and answer questions occasionally.
- DO NOT post homework solutions on Piazza.

Python Versions

Your laptop will most likely use python 3, but the PIC lab computers use version 2. Whenever you hand in homework, make sure that your code works on the PIC lab machines. The differences are small and I will point them out when we come across them.

Enrollment note

- If you are not already enrolled in the course, you can only get into this class via the waitlist.
- Contact the undergraduate math office MS 6356 if you have any questions.

Attendance

- Class times: MWF 10 am-10:50 am
- Discussion sections: Tuesday & Thursday

- Attendance is NOT mandatory, but you are still responsible for all material covered during the lecture.

Office Hours

- (Tentatively),
  - MF 10:50 am – 11:50 am in PIC Lab
  - W 9:00 am – 10:00 am in MS 7354
  - and by appointment in MS 7354
- Any strong objections?
- TA's office hours: TBD

Homework

- There will be 8 homework assignments total this quarter. The lowest score will be dropped.
- 5pm on Friday is the deadline for turning in homework. Homework #1 is due on Friday Jan. 18.
- No late homework assignments will be accepted.
- You must follow the guidelines for homework submission in order for your file to be accepted.
- The homework assignments will be uploaded to CCLE; don’t email your homework.

Grading

- 6 – 7 quizzes in discussion sessions on Tuesdays (first quiz on Jan. 17)
- Final project
- Final Exam: 03/19/2019 8 am – 11 pm

Homework	**40%**
Quizzes	**10%**
Final Project	**20%**
Final Exam	**30%**

Academic Honesty

- Cheating is not just copy and paste.
- Cheating involves copying parts of code or sharing your code with others.
- Do not share your code with anyone.
- Feel free to use pseudocode in discussion.
- If you need help, ask your TA or the professor.
- If you are unsure about what is permitted, ask.

Special Needs

- If you qualify as special needs it is your responsibility to contact me well in advance of any exams.

Email Policy

- Post your questions regarding course material, assignments, and software on Piazza discussion forum.
- The teaching staff will not answer email questions.
- However, private matters (such as rescheduling an exam due to a medical emergency) should be discussed via email.

Getting started

- Follow the instructions in **GettingStarted.pdf** on CCLE before next class
  - Using the command line
  - Using a Jupyter Notebook
  - Using Spyder (IDE)

5 Major Differences: Python vs C++

C++

- Compiled
- Manual memory management / garbage collection
- Statically typed
- Variables exist on the stack (some objects on the heap)
- All variables are mutable, unless `const`

Python

- Interpreted
- Automatic garbage collection and no explicit pointers
- Dynamically typed
- Only variable *names* are on the stack, all contents are objects on the heap
- Some variables are *immutable*

https://www.quora.com/What-is-the-difference-between-Python-and-C++

12 Syntactic Differences: Python vs C++

C++	Python
;	(end line)
{}	(indentation)
for (i = 0; i < 10; i++){}	for i in range(10):
if/while(x){}	if/while x:
int fun(){}	def fun():
#include	import
true/false	True/False
//	#
&&, ||, !	and, or, not()
x++	x=x+1
cout, cin	print, input/raw_input
const	(no equivalent)

http://www.unco.edu/nhs/mathsci/ClassSites/hoppercourse/CS102/S08/syntaxcompar.html