MIT 5032
Analytics Programming: Python
Spring 2023, Mod 3
Thursday, 6:00pm-9:30pm
Price Hall 2020

Instructor: Heshan Sun, Ph.D.
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(405)325-5721 (phone)
Course website: https://canvas.ou.edu/

Office Hours:
Monday: 7:00pm-8:00pm (on Zoom)
Thursday, 5:00pm-6:00pm (in person)
Or appointment by email (sunh@ou.edu)

Teaching Assistant and Office Hours:
Andy Xing (PhD Student of MIS; email: xingqidi@ou.edu)

1. In-person office hour:
Time: Friday 3pm-4pm
Location: Adams Hall 3225A

2. Zoom office hour
Time: Friday 4pm-5pm
Zoom link: https://oklahoma.zoom.us/j/3875824624?pwd=b2Qxd2EvaVJ4Q01HKzFJQVR3MjZlQT09
Meeting ID: 387 582 4624
Passcode: AndyXing

A Poem of Python:

The language of Python is a mystery,
A tool of complexity and clarity.
It holds the power to build and create,
A system of logic that's hard to debate.

It speaks of objects and of classes,
With functions and conditions and other such masses.
It can be used to write programs big and small,
From a simple game to a complex algorithm all.

It can be used to make websites and applications too,
Where the possibilities are all up to you.
Python is a powerful language that's here to stay,
So open up your IDE and write away.

-- ChatGPT (November 2022-)

Course Description

OFFICIAL CATALOG DESCRIPTION: Prerequisite: graduate standing. Programming in languages used for data extraction and preparation of data for data analytics and data mining. Can be repeated with change of content; maximum credit 6 hours.

Python is a popular object-oriented programming tool for business analytics. This course will expose students to the Python analytical programming language. This course introduces the Python programming language and popular packages as tools to clean, slice, and build data. Basic principles of programming are explored as well as basic techniques for conducting data science projects. I assume that you have learned basics of Python (e.g., in MIT5602). Students are expected to have some basic understanding of statistics and feel comfortable with working with data and numbers.

Course Objectives:

Students who successful complete this course should be able to:

1. Understand fundamental principles of programming, including data types, variables, loops, functions, conditional statements, lists, dictionaries, functions, and objects.
2. Demonstrate basic Python and programming literacy by interpreting and commenting on Python code written by others.
3. Make use of Python community programming best practices by following recommended naming conventions and style considerations.
4. Compose Python data wrangling and analysis programs by combining custom developed code with modules from Python's built-in libraries and from modules maintained by third parties.
5. Demonstrate ability of importing and working with external Python libraries for a given task.

Course Materials

(***Required***) Al Sweigart, Automate the Boring Stuff with Python, 2015, No Starch Press, ISBN-10: 1593275994. A free online edition of the textbook is available under a Creative Commons license: https://automatetheboringstuff.com
Other materials will be provided by the instructor throughout the course.

Class Conduct

We will have in-person class during the class time (Thursday 6:00pm-9:30pm). Attendance will be taken. Optional office hours will also be synchronous Zoom sessions. Various learning activities such as lectures, in-class exercises, quizzes/exams, labs, etc. will be used in class. Students are expected to participate in these activities actively.

Technical Requirements

You need (1) a laptop, and (2) wireless Internet connection in class. We will use laptops regularly in the classroom. Given the nature of this course, you should bring a well-functioning laptop with the following software installed to each class. We don't have time in class to deal with installation or other technical issues. So you need to make sure all applications are installed PRIOR TO the class.

1. **Anaconda** will be used for our Python lab. Anaconda has Jupyter notebook and Python. So you only need to download Anaconda at:

   Windows: https://www.anaconda.com/download/#windows
   MacOS: https://www.anaconda.com/download/#macos

Syllabus Changes

This is a dynamic syllabus, meaning it may undergo change. Although all changes in the syllabus will be announced in class, it is the student's responsibility to review the syllabus for changes each week. The latest syllabus will be posted on Canvas.

Grading

Final Exam	20%
Group project	20% (1 project)
Quizzes	20% (2 quizzes, 10% each)
Assignments	30% (3 assignments, 10% each)
Participation	10%
Total	**100%**

Final Exam (20%)

A final exam will be administered in the last class of the course.

Group project (20%)

We have one group project. Each group consists of around 5/6 people. The group will work together on a self-identified topic using Python. The deliverables will be a report and in-class presentation. Details will be available in class.

Quizzes (20%, 2 quizzes, 10% each)

Two in-class quizzes will be administered in class. Each quiz takes 20 minutes. The schedule of these quizzes can be found in the Weekly Schedule below. Details about the quizzes will be announced in class.

Assignments (30%, 3 assignments, 10% each)

Two individual assignments will be administered. You have one week to finish each assignment. The schedule of these assignments can be found in the Weekly Schedule below. Details about the assignments will be announced in class.

Participations (10%)

Participation is essential for this course. Therefore, a significant factor in determining grades will be the degree to which you participate in class.

The Participation grade is computed as follows:

Attendance – 60%, Active participation in class activities – 30%, Professionalism – 10%.

10 points will be deducted for each absence, failure to participate in labs and other class activities, and deficiencies in professionalism (such as improper laptop use, talking in class, arriving late or leaving early, etc.). Only if a student is attending a university-sponsored event or having well-documented illness will be excused. To get a full participation score, you also need to participate in class activities and discussion very actively. Concentrating on the class during our class time is essential for learning. Do NOT do other things other than the instructed activities. Do NOT do assignments for other courses in this class.

Bonus Credits: One or two bonus credits may be available for participation in research projects and/or the attendance of professional development events. Opportunities will be suggested throughout the semester.

Grading will be based on a standard scale: (A=90+, B=80+, C=70+, D=60+, F=60-)

Weekly Schedule (Tentative)

Note: I expect everyone to have read all assigned materials **prior to** class.

Date	Topic	Materials	Notes
Jan 19	- Course introduction - Background: Python	- Sweigart, Chapter 1 (Python Basics) - Object-Oriented Programming Optional: - 6 Reasons Why Python is Suddenly Super Popular - Top 4 Reasons Python is So Popular in 2023	
Jan 26	Variables, manipulation and flow control	Sweigart, Chapters 1 (Python Basics), 2 (Flow Control) and 6 (Manipulating Strings)	Group formed; group project available
Feb 2	Flow control and functions - Conditional statements - *for* loops - functions	Sweigart, Chapters 2 (Flow Control) and 3 (Functions)	- Quiz 1 - Homework 1 available
Feb 9	Structing data: list and dictionary	Sweigart, Chapters 4 (Lists) and 5 (Dictionaries and Structuring Data)	- Homework 1 due - Group project topic selection due
Feb 16	- Deal with files - Design own Class	- Chapter 9: Reading and Writing files - Python Classes	- Quiz 2 - Homework 2 available
Feb 23	Python functions	Sweigart, Chapter 3.	- Homework 2 due - Homework 3 available
March 2	Data science extensions (1): analytics - pandas - scikit-learn	- Sweigart, Appendix A (p.441-442) - Pandas user guide - Association rules -	Homework 3 due
March 9	- Final Exam - Group project presentation		Group project due

Policies

Incomplete Grade

A grade of I (for incomplete) will not be given under normal circumstances. Not performing well in class, not being able to complete an assignment in time or being out of town during a test are inadequate reasons for requesting or granting an incomplete. Only circumstances beyond your control (such as a severe illness), which will need to be documented, may warrant a grade of I.

Course Conduct

It is your responsibility to read all assigned materials and have the software application installed properly before coming to class. I do not wish to spend class time going over material which is already covered in the text or help you install software. I expect everyone to participate in class discussions.

Finally,

- Do not read the newspaper or other books in class.
- Do not do assignments for other courses in this class.
- Do not repeatedly talk or otherwise disturb the conduct of this class.
- Please silence your phones when you are in class.

University Policies and Resources

Reasonable Accommodation Policy:
"The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone 405/325-3852 or TDD only 405/325-4173."

Religious Holiday Policy:
"It is the policy of the University to excuse the absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required classwork that may fall on religious holidays."

OU Resources on Copyright and Piracy:
http://www.ou.edu/content/ouit/security/copyright.html

Adjustments for Pregnancy/Childbirth Related Issues:
Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based on temporary disability. Please see www.ou.edu/content/eoo/faqs/pregnancy-faqs.html for commonly asked questions.

Title IX Resources
For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on-call 24/7, counseling services, mutual no contact orders, scheduling adjustments and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office 405-325-2215 (8-5, M-F) or OU Advocates 405-615-0013 (24/7) to learn more or to report an incident. Additional information can be found at: http://www.ou.edu/content/eoo.html

Course Attendance Policy (Covid 19)
A temporary university policy has been established to protect the OU community by ensuring that students who are ill or required to isolate feel encouraged to remain at home. Missing a class session or other class activity due to illness or isolation will not result in a penalty for the absence, and the student will not be asked to provide formal documentation from a healthcare provider to excuse the absence. This policy is based on all students and faculty adhering to the principles of integrity, honesty, and concern for others.
Students who are experiencing symptoms of COVID-19, including cough, fever, shortness of breath, muscle pain, headache, chills, sore throat, loss of taste or smell, congestion or runny nose, nausea or vomiting, or diarrhea or who have been in close contact with others who have symptoms should:

- Remain at home to protect others
- Ensure that any needed screening has been conducted (COVID-19 Screening and Reporting Tool) and any needed treatment obtained
- Contact the instructor prior to absence or inability to participate, if possible, and provide an honest report of the reason for which you cannot attend class or complete a course activity
- Continue to complete coursework to the extent possible, using Canvas, zoom, and other online tools
- Submit assignments electronically to the extent possible and as directed by the instructor
- Communicate with the instructor to arrange modifications to deadlines or work requirements or reschedule exams or other important course activities, when it is necessary