DTSC 575: Principles of Python Programming

Fall 2, 2022, Online; 3 Credits

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Office Hours through Zoom by appointment

Course Objectives

Upon completion of the course, students should be able to:

1. Create and run Python programs
2. Utilize all course concepts in the creation of Python programs
3. Utilize CodeGrade to assess programming knowledge

Important Dates

- Course start: October 17, 2022
- Last day to add/drop (without charge): October 24, 2022
- Last day to withdraw (without academic penalty): December 11, 2022 5PM EST
- Last day of term: December 11, 2022
    - You can complete assignments up to midnight EST December 11, 2022

Course Description

This course will teach students the introductory skills of programming, problem solving, and algorithmic thinking in Python. Topics include variables, input/output, conditional statements/logic, Boolean expressions, flow control, loops and functions. Approachable for students who have no experience with Python.

Course Delivery

This course will be taught through Brightspace, Eastern's learning management system. It is expected that you will watch the videos, complete the optional, non-credit quizzes, and proceed to the required exams and coding assignments. However, if you prefer to learn from another resource, that is okay, too - we simply want you to learn.

Because this is a self-paced course, our expectation is that you will learn using our lectures, the text, or other resources we provide. If that fails, feel free to look online to sources like Google (an indispensable resource). The main reason to turn to these resources is that we want you to be able to find help when you need it, and not rely on a response from us 24-48 business hours after your email. As I've mentioned to many of you, if you plan five hours to learn on a Saturday, and get stuck one hour in, you will not want to waste the next four hours you've budgeted for. Indeed, learning to find assistance quickly is an important skill to learn in and of itself!

While this course is self-paced, it is critical that you work ahead of time. If you choose to wait until the end of the term to complete work it is your choice, but you will not be given additional time if you encounter last minute problems such as issues with technology, CodeGrade, Brightspace, email, etc. Unforeseen circumstances warranting incompletes are discussed below.

Communication

You are responsible for all communication you receive to your eastern.edu email account. You will receive email updates for classes, registration, career services, etc., so this is very important.

There are several means of communication when questions arise. The primary distinction in how to communicate with us is whether you have a personal question or a course content question.

For questions about course content, such as issues about exam content or to get a better understanding of a topic you can email dtsc_ga_575@eastern.edu or ask other students through the discussion boards.

Certain issues, like Kaltura video problems, I don't have the ability to change, personally, and will forward the email to the appropriate person. However, if there are things that are more personal, always feel free to reach out to me.

All questions about the course that will impact your final grade must be received 48 hours prior to the end of the term.

We encourage you to first consider posting to the discussion board when you have questions (with the exception of personal questions). Though there may still be times you need to reach out to one of us via email.
Please take note of the following when emailing:

If you have a question/comment about course content, include all that apply:

- Course number
- Module number
- Video title
- Quiz name/number; Question number (or description of specific question)

- Screenshots/links to support your question
- Details of your attempt to understand/troubleshoot on your own

If you have a question/comment about something that is not related to course content:
- Course(s) you are enrolled in
- Screenshots/links to support your question
- Details of your attempt to understand/troubleshoot on your own

If you have troubles in regards to installing the following: Python, Jupyter Notebooks, Anaconda, R, RStudio, PostgreSQL, sklearn, tensorflow, videos not playing on the device, etc., you can email the Tech Support Team (dtsc_techsupport@eastern.edu). Please use your Eastern email address when emailing the Tech Support Team.

Note: Providing this information will help us to more efficiently and effectively assist you. Thanks so much!

Textbook

We will use Introducing Python: Modern Computing in Simple Packages, Second Edition, ISBN: 978-1-492-05136-7. You can learn completely through videos, but the text has other sections that you might find helpful, so I suggest you purchase a copy.

Further, feel free to use any resource you find helpful. If you prefer to watch YouTube videos, or any other source, that is fine with me. If you find particularly useful texts, websites, or other resources, please share them with me and our class through the discussion board.

Text-like online resources:

Learn Python/Break Python
Dive Into Python3
Think Python
Hitchhiker's Guide to Python
Introduction to Python
Computational and Inferential Thinking
Automate the Boring Stuff

Coding challenge sites:

www.codewars.com
https://edabit.com/challenges
https://www.w3resource.com/python-exercises/python-functions-exercises.php
https://leetcode.com/
https://www.hackerrank.com/

Youtube links

freeCodeCamp

Socratica
Programming with Mosh

Technology

We'll be running Python 3, which will run on any decent, mid-level laptop. You can code in the environment you're comfortable in, as we'll go over in the coursework.

Our university suggests the following, and everything we do *should* be okay with this. Now, if you start getting into gigantic data usage we might need to have a different conversation, but this should serve you well.

- (PC): Pentium processor, 4-8 gigs of RAM, 500 GB hard drive,or128 GB SSD drive, wireless, Windows 7 and above is required.
- (Mac): at least 4 GB of RAM, 128-256 GB hard drive, OS 10.0 and above.

Grading

Exams (40%) - 5 Exams

Following most modules, you will take an exam through Brightspace as you have done in previous courses. The purpose of exams in this course is to prepare you for CodeGrade assignments. These exams will cover topics abstractly, while CodeGrade assignments will be where you demonstrate you can create programs.

You will be able to retake exams. Exams will consist of a random pool of questions; therefore, each time you take the exam you should expect to see different questions. We have set up the exams such that you will see a random selection of questions from each topic in a module, though, so you should be quizzed over a representative selection of questions.

You will be required to retake exams until you earn 80% before you can view subsequent exams. There are several reasons for this.

First, in order to graduate, you need a B average, which is roughly 80% (see page 34 in the catalog). Second, we genuinely believe if you want to be successful going forward, an 80% is the minimum level in the course. With that being said, your final grade for each exam will be the result of your highest attempt on the exam, and your overall grade will be the average of each of your exam grades.

Exams will consist of multiple choice, short answers, and fill in the blank questions. You may not use Python for any exam questions unless it explicitly states so.

Following your exam, you will be able to view which questions you answered correctly and incorrectly. However, when you decide to view the submission, you will only have 15 minutes to

do so. The reason we do this is to keep the exam questions from becoming public, while also trying to help students understand where they were correct and incorrect. Please make sure to view your submission at a time and place where you won't be distracted.

CodeGrade assignments (60%) - 22 assignments

Following the functions exam you will be able to begin CodeGrade assignments. Please view the videos on Brightspace that explain how CodeGrade assignments must be turned in. Assignments will be automatically graded based on expected input and output.

For each assignment you will need to create a .py file with a specific name; without that name, your program will not be run properly.

It is possible to find ways around the instructions and create programs that "pass" without following the instructions (ex. Improper use of sys.argv). Because of this, at the end of the semester we will be auditing submissions to be sure that the final submissions follow the guidelines. If they do not, we deduct points appropriately. For example, if you are asked to create a program that loops through a list and prints a value, but you don't use a list, you will be partially deducted. However, if you use conditionals instead of loops, you would **lose all points for the assignment**. If you have any concern about this please email dtsc_ga_575@eastern.edu and we will help.

Grade Scale

93+	A
90	A-
87	B+
83	B
80	B-
77	C+
73	C
70	C-
< 70	F

Academic Policies

The following is not intended as a comprehensive restatement of the academic policies and procedures of the Eastern University. Some material is excerpted from longer statements printed in the College Catalog and the Catalog includes policies not noted here. The student and instructor are referred to the Catalog for college-wide policies and to Student and Instructor Handbooks of the programs or departments in which this course is offered for supplements or context-specific definitions of those college-wide policies.

Academic Dishonesty

The student is responsible to become familiar with acceptable standards for research and documentation and to abide by them. The definition of academic dishonesty and its penalties are defined and articulated in the Catalog and the Data Science Program handbook. Students are fully responsible for knowing and adhering to these policies.

It is our expectation that the work you do as a part of Eastern University will demonstrate honest and ethical behavior. **The primary rule to ensure academic integrity is that all submitted work must be your own. Collaboration is not permitted on any part of an assignment.**

To ensure academic integrity, you may not view another student's work before you turn your work in. You are also not permitted to show your work to another student that hasn't turned their work in. Collaboration between students is only permitted if you are asking for clarification on a topic or assignment instruction. Collaboration on quizzes and exams is not permitted.

Incompletes and Extension of Due Dates

The only way to complete work after the end of term due date is through incompletes (https://www.eastern.edu/sites/default/files/inline-files/2021gradcat.pdf). Incompletes (1) are for when a "student fails to complete course requirements because of extreme and unforeseen extenuating circumstances that may have affected academic performance", and (2) "must be approved by the professor teaching the course." Any request for additional time to complete assignments must satisfy the conditions set forth in the catalog (link above), and unless there are extenuating circumstances, must be approved by the instructor before the end of the semester. Students should note that this is exceedingly rare, and truly require "extreme and unforeseen extenuating circumstances." In order to qualify for an incomplete, students must have completed at least 50% of graded items in the course (exams, assignments, quizzes, etc.)

Student Disability Policy

Notice to students with Physical or Learning Disabilities: In order to be entitled to disability accommodations at Eastern University, students must submit a written request to the Cushing Center for Counseling and Academic Support (CCAS) and be found eligible for accommodations. In order to make an accommodation for this course, the professor must receive a written request from CCAS. Disability accommodations are not retroactive and will not be implemented until a request from CCAS is received. All accommodations must be reactivated by the student prior to the beginning of each new academic session. For further information, please go to:
http://www.eastern.edu/student-life/academic-support-counseling-and-disability-services/disability-accommodations

Class Attendance Policy

This course is asynchronous and online, which means we will not have a formal time to meet. Therefore, you will not be required to attend class. From time to time, we will check and see who has been active and who has not. If we email you about this, please know we're just trying to look out for you.

Copies of Course Assignments

Students are responsible for retaining a copy(ies) of all materials submitted for grading. If a paper or project is misplaced or lost in transition, the student must provide a substitute copy upon request.

Emergency and Crisis Information

In the case of an emergency event, we ask that all community members use their best judgment. We also recommend that each member of this community become familiar with emergency procedures. Call Eastern's Public Safety department at 610-341-1737 for emergencies on the St. Davids campus or building security or call local police at other locations.

If the university closes for weather or any other reason, this should have little impact on us; all content is already available to you on Brightspace. However, in extraordinary circumstances there we may have to alter class. In any case, it is expected that you keep up with your email, as instructions will come any time the university closes.

Office of Talent & Career Development

The Office of Talent and Career Development specializes in assisting Eastern University undergraduate and graduate students as they consider their plans for the future in the following ways: discovering God-given talents; choosing a major/minor; developing resumes, cover letters, and application materials; gaining experience through internships/practicums; and enhancing networking, job search, and professional skills. More information, resources, and our career event calendar are available at www.eastern.edu/careers.

To set up an appointment with a career counselor, please email careers@eastern.edu or stop by Walton 202. Log in to Eastern's online exclusive internship and job board, Handshake, at eastern.joinhandshake.com.

Statement of Diversity, Equity and Belonging:

Eastern University is a teaching and learning community that seeks, as a priority of the Christian faith, to engage and understand the full range of diverse human perspectives and experiences. To that end, we invite people with diverse backgrounds in terms of race, ethnicity, age, nationality, religion, culture, disability, socioeconomic status, sex, gender, and other unique

identities to join and enjoy the benefits of our faith-based community.

Statement of Mandated Reporting/Title IX

Eastern University is committed to providing a community in which all of its members feel safe and respected. To this end, please be aware that all teaching faculty of Eastern University are mandatory reporters. Should you disclose or they observe sexual assault, sexual harassment, interpersonal violence, or stalking, or some other form of abuse, they are required to report this to Eastern University's Title IX Coordinator. Reports of sexual misconduct or criminal behavior can be reported via this link: www.eastern.edu/form/report-sexual-misconduct. For additional information, please contact Eastern University's Title IX Coordinator by emailing titleix@eastern.edu.

Tentative Course Schedule

Module 0: Course introduction

(Chapter # refers to *Introducing Python* chapter

- Course overview
- Course introduction
- Syllabus
- Textbook
- Resources
- Chapter 1
    - Python Pros
    - Python Cons
- Program Challenges
- Python, IPython, and editors
- Text editor links
- IDEs
- Where you should be

Module 1: Python review

- Module overview
- Chapter 2
    - Data are objects
    - Data types
    - Mutability
    - Literals and strings review
    - Variable names and places
- Chapter 3
    - Booleans
    - Integers
    - Bases
    - Type conversions
- Chapter 7
    - Tuples, part 1
    - Tuples, part 2
    - Lists
    - Iteration and list comprehensions
    - Copy and deep copy
- Chapter 8
    - Dictionaries
- Chapter 4
    - Comments
    - Continuing lines

- Module review

Module 2: Advanced strings, conditionals, & loops

- Module overview
- Chapter 5
    - Strings, part 1
    - Strip, case, alignment
    - Old style formatting
    - New style formatting
    - f-strings
- Example
- Module wrap-up
- Control structure overview
- Chapter 4
    - Conditionals
    - Walrus operator
- Example
- Module wrap-up
- Loops overview
- Chapter 6
    - Loops review
    - Breaks
    - Continue
    - Range
- Example
- Module wrap-up

Module 3: Functions

- Module overview
- Programs disclaimer
- Chapter 9
    - Functions review
    - None
    - Arguments and parameters
    - Exploding and gathering
    - Keyword and mutable arguments
    - Docstrings
    - lambda
    - Exceptions
- Month abbreviation
- Sphere
- Module wrap-up

Module 4: Object-oriented programming

- Module overview
- Chapter 10
- Example
- Module wrap-up

Module 5: Py Sci, Stats, and leftovers

- Module overview
- Chapter 11
    - Packages
    - Modules vs. objects
- Chapter 19
    - Packages
    - Virtual environments
    - https://www.dabapps.com/blog/introduction-to-pip-and-virtualenv-python/
    - https://the-hitchhikers-guide-to-packaging.readthedocs.io/en/latest/pip.html
    - Style Debug
- Example
- Module wrap-up
- Py Sci & Stats overview
- Chapter 22
    - Statistics introduction
- Statsmodels introduction
- t-test
- ANOVA
- Regression
- Module wrap-up
- Course wrap-up