

Principles and Practices of Python Application Development

COP 4xxx

Department of Computer Science, Florida State University

Class Time and Location

TBA

Credit Hours

3 credit hours

Instructor Information

TBA

Teaching Assistants

TBA

Class Homepage

Course Website: TBA The course Canvas site contains all information related to this class including lecture slides, assignments, extra material handed out during class, and links to some useful resources. The Canvas site will also be used to submit assignments, post grades, and send out announcements.

Prerequisites/Co-requisites

This course is an intermediate course in Python. Students are expected to be competent with the programming material that is taught in an introductory programming course.

All students taking COP 4xxx are required to have previously taken and passed (with a C- or higher final grade) COP 3330 (Data Structures, Algorithms, and Generic Programming I) or an equivalent course.

Course Description

Python is the programming language of effective software development utilized in a variety of fields. Python is frequently used in concert with tools and applications to build, launch, and maintain large-scale software products.

The first third of this course will examine the internal structure and behavior of the Python programming language. The rest of this course will explore and demonstrate several widely-used Python libraries

in conjunction with contemporary development tools, in different scenarios to solve a diverse set of problems.

Course Objectives

The course will include lectures on using the Python programming language and some select industry-standard Python modules and libraries in the context of . Topics will demonstrate the versatility of the Python language. Upon completion of the course, students would be able to

- Design and develop programs using the fundamental elements of the Python programming language.
- Create small applications that utilize standard Python Data Structures including Lists, Dictionaries, Sets, Tuples, and Maps.
- Build Python applications that use Graphical User Interfaces and Web-Based Technologies.
- Design, develop, and implement a small-scale application that utilizes contemporary programming techniques; specifically - full stack development, containerization, and distributed scaling.
- Add functionality to existing Python Applications
- Debug, troubleshoot, and resolve bugs/issues in Python applications.
- Identify the benefits and downsides of various Python libraries.

Course Schedule

This is a tentative course schedule, which lists the topics by week.

- Week 1: Python fundamentals - Syntax, variables, sequences, and selection
- Week 2: Python Fundamentals - Loops, Lambdas, and Functions
- Week 3: Python fundamentals - Object Oriented Programming
- Weeks 4 and 5: Python Data Structures - Lists, Dictionaries, Sets, Tuples, Maps, Stacks, Queues
- Week 6: Advanced Function Concepts - map-reduce, closures, decorators, generators, iterators.
- Week 7: Python Graphical User Interface Programming
- Weeks 8, 9: Persistence, databases, and Python-database interaction
- Week 8, second class period: Midterm
- Weeks 10, 11, 12: Full stack development - integrating Python with JavaScript Frameworks and databases to realize a client-server application
- Week 13: Multi-platform development and containerization
- Week 14: Scaling up and out - deploying Python application on a cloud platform
- Week 15: Logging, Optimization, and Deployment Tools, Launching an application, working with PyPi and pip to publish an API
- Final Exam - during Finals Week

Textbook

Python Application Programming, Authors: Piyush Kumar and Biswas Parajuli, ISBN: 978-0-9981694-0-8, URL <https://pybook.rocks> This is the only textbook required for this course.

Assignments, Projects and Tests

Homework Assignments

Homework Assignments will be given periodically throughout the semester. They will be posted on Canvas. Students will have a week to 10 days to complete these assignments. Assignments are not optional. Students must submit all the homework assignments to make an attempt at getting full credit for the homework/assignment component of the grade.

Exams/Tests

There will be two exams over the course of the term. The tentative date for the midterm is the second class period of Week 8. The final exam will be given during the scheduled time slot during finals week.

Group Project

The course project is a semester-long project which will be assigned toward the beginning of the course. Students must work in groups ideally comprised of 3 - 5 members. Students are required to submit a proposal at the beginning of the semester. All project work will be done using a code repository like GitHub. The instructor will closely monitor the student's individual contributions to the project. The grade for the project will be based on:

1. Overall functionality.
2. Meeting all requirements stated in the original proposal.
3. Utilization of Python libraries and tools for developing and deploying the project.
4. The size and quality of the student's individual contribution to the project.
5. Overall quality of code (PEP8 guidelines, code organization, coverage, complexity, test systems, build systems, documentation).

The group is also expected to present a short demonstration of the project for the course at the end of the semester.

Quizzes

Weekly quizzes are used to track students' progress in the course. They will involve a few questions from the previous week's class material and will be done using Canvas. Students would have 24 hours to complete 15-minute quizzes.

Grading Policy

The final course grade will be computed on a weighted average basis as follows:

Component	Weight
Quizzes	15%
Homework Assignments	40%
Group Project	15%
Midterm Exam	15%
Final Exam	15%

The final grade will be calculated according to a numerical average as shown in the table below.

		A	>93	A-	92.99 - 90
B+	89.99 - 87	B	86.99 - 83	B-	82.99 -80
C+	79.99 - 77	C	76.99 - 73	C-	72.99 -70
D+	69.99 - 67	D	66.99 - 63	D-	62.99 -60
F	<60				

In addition to the scale listed above, in order to earn a C- or better in the course, a student is required to achieve a test average of C- or better. If the test average is below this level, the highest possible course grade is a D+.

The test average can be computed with the following formula:

$$\text{TestAvg} = ((\text{Midterm} * 15) + (\text{FinalExam} * 15)) / 30$$

Unexcused Late Assignment Policy

Students are expected to turn their assignments in on or before the due date. Unexcused late assignments will suffer a 15 percentage point penalty for the first 48-hour period. For example, a grade of 180 on an assignment worth 200 points turned in late will receive a 27-point penalty. Assignments turned in more than 2 days after the due date will receive a grade of '0', but students can still have it graded and receive feedback.

Missed Exam Policy

If a student misses an exam (midterm or final) and has a documented excuse for the same, they may schedule a make-up exam by contacting the instructor within 24 hours of the missed exam, with the documentation. The make-up exam will be a different set of questions at the same difficulty level. The make-up exam for the final exam should be completed by 5 PM on the Friday of finals week.

University Attendance Policy

Excused absences include documented illness, deaths in the family, and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid written excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of student's academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "...be honest and truthful and...[to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/academic-resources/academic-integrity-and-grievances/academic-honor-policy>)

Academic Success

Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Department of Student Support and Transitions to learn more.

Americans With Disabilities Act

Florida State University (FSU) values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive, and welcoming. FSU is committed to providing reasonable accommodations for all persons with disabilities in a manner that is consistent with the academic standards of the course while empowering the student to meet the integral requirements of the course.

Students with disabilities needing academic accommodation should:

- (1) register with and provide documentation to the Office of Accessibility Services; and
- (2) request a letter from the Office of Accessibility Services to be sent to the instructor indicating the need for accommodation and what type; and,
- (3) meet (in person, via phone, email, skype, zoom, etc...) with each instructor to whom a letter of accommodation was sent to review approved accommodations.

Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from the Office of Accessibility Services has been provided.

This syllabus and other class materials are available in an alternative format upon request.

For the latest version of this statement and more information about services available to FSU students with disabilities, contact the: Office of Accessibility Services

874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
oas@fsu.edu
<https://dsst.fsu.edu/oas>

Confidential Campus Resources

Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

Victim Advocate Program University Center A, Rm. 4100 (850) 644-7161 Available 24/7/365 Office Hours: M-F 8-5 https://dsst.fsu.edu/vap	University Counseling Center Askew Student Life Center, 2nd floor 942 Learning Way (850) 644-8255 https://counseling.fsu.edu/	University Health Services Health and Wellness Center (850) 644-6230 https://uhs.fsu.edu/
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Free Tutoring From FSU

On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options - see <http://ace.fsu.edu/tutoring> or contact tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.