COE 332: Software Engineering & Design, S2020

Time and place: ASE 1.112A; T,Th 11 am - 12:30 pm.

Listed Instructor
Joe Stubbs, jstubbs@tacc.utexas.edu

Office hours

- Immediately after this class or by appointment
- ACB 2.252 or can meet via Zoom
- Slack https://coe332-spring2019.slack.com ← ALL class-wide communications (not email or Blackboard)

Additional Instructors

- Charlie Dey - charlie@tacc.utexas.edu
- Brandi Kuritz - bkuritz@tacc.utexas.edu

TA:

Overview
The objective of this course is to introduce students to more advanced computing concepts in software engineering, software systems design, cloud computing and distributed systems, and computational engineering. Through a series of assignments spanning the course of the semester, students will build a cloud-based, computational system to analyze a time series dataset and provide a web-accessible interface to their system.

The primary topics covered include: software development in the Python programming language, HTTP and RESTful web services, Git, Testing methods for large systems and Continuous Integration, Virtual Machines (VMs) and Linux Containers, Databases, Queues, and Asynchronous Programming Patterns in Distributed Systems. Advanced topics in Web Security, Alternative Cloud Computing Models and DevOps Automation will be introduced, depending on interest and available time.

Grades
Grades for the course will be based on the following:

- 30% Homework - Approximately 8 assignments, assigned on Tuesdays and due the following Tuesday. The lowest score will be dropped.
- 30% Midterm - We will have a written midterm **in class**
- 40% Project - Students will form groups and will submit a final class project comprised of a distributed, web-accessible, cloud system to analyze a time series dataset. The project will draw from and build upon work done throughout the semester in homework assignments. More details will be given in the upcoming weeks.

Prerequisites

This course assumes familiarity with the Python programming language and strong working knowledge of basic, high-level language programming concepts including: data structures, loops and flow control, and functions. We also assume a basic, working knowledge of the Linux command line.

We will briefly review programming concepts in Python during the first week of class, the first homework assignment will be based on these topics, and we will make every effort to help students who are less familiar with these concepts in Python. Ultimately, each student is expected to and responsible for mastering this material. This is not an introductory programming class and we will not have time to give a comprehensive treatment of all of these topics.

Course Materials and Resources
Most class meetings will be comprised of lectures/demonstrations and hands-on labs. Students are expected to attend every lecture and actively participate in the hands-on labs during the class. The hands-on portions will often solve parts of homework assignments.

Lecture materials with worked examples will be posted to the class bitbucket repository right before the class meeting. Additionally, there will be a class slack channel for discussing ideas about the course with your fellow students. There is no textbook for the class.

Slack URL: https://coe332-sp2020.slack.com
Class repository: https://bitbucket.org/tacc-cic/coe332

Approximate Schedule and Key Dates (subject to change)
- Week 1: Linux and Python review
- Week 2: Unit testing and source control
- Week 3: HTTP, REST and Flask
- Week 4: Flask continued, and Integration testing
- Week 5: Virtualization: VMs and Containers
- Week 6: Databases
- Week 7: Review/ Midterm Exam
- Week 8: Persistence in REST
- Spring Break
- Week 9: Continuous Integration
- Week 10: Asynchronous Programming
- Week 11: Queues
- Week 12: Queues continued/ Thanksgiving Break.
- Week 13: Topics
- Week 14: Topics
- Week 15: Topics - Final Week of Class
- Project Due

Attendance
Regular attendance is expected but absences will not count against the student's grades with the exception of the midterm exam. We expect students to give us a week notice in advance of their absence if known ahead of time.

Office Hours
Office hours will be for 1 hour after class and by appointment. We also plan to use Slack to communicate with the students. https://coe332-spring2020.slack.com

Important Dates
- - Last day to drop or refund
- - Spring Break
- - Last day of class and final project due

Special Notes
The University of Texas at Austin provides upon request appropriate academic adjustments for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TDD or the Cockrell School of Engineering Director of Students with Disabilities at 471-4321.