

Stuyvesant High School Computer Science MKS21QJI- Software Development Term 1

teacher:

email:

office:

available periods:

course website: www.stuycs.org/courses/software-development

Course Description:

Software Development is a year long course focused on large project development. Students are introduced to industry standard tools and practices while working in teams to create web based applications. Students learn full stack development using flask (python), javascript, html, and css. Also included are sql and mongo databases as well as various css/html and javascript frameworks.

AP Computer Science is a prerequisite for Software Development.

Required & Recommended Tools:

- Notebook/Section in binder.
 - All students are required to take physical (pen & paper) notes for this class (barring any required accommodations).
- Github account: <https://github.com>
- Oline chat/discussion forum.
 - Invitation links will be sent out during the first week of class, you must accept.
- Recommended
 - Access to a computer outside of class.
 - Don't forget about the CS Dojo (307, M-Th, 3:45 - 5)
- Your notes will be your primary resource, and the most up-to-date information on the class materials. When applicable, links to primary documentation for the tools used will be provided (such as: <https://palletsprojects.com/p/flask/>). Use of other online resources, such as stack overflow, should only be considered after checking primary documentation and the class Q&A forum.

Course Requirements:

- Treat each other with respect.
- Come to class on time.
 - Absences and latenesses must be accompanied by a note.
- Participate in class discussions, including the online Q & A forum.
- Submit work on time.
 - **There are no exams** in this course, your grade will be primarily made up from your submitted work.

Grade Breakdown:

- Participation: 10% (this includes in-class discussions, Q&A participation and group work).
- Work assignments: 20%
 - There will be approximately 2 assignments a week, involving a mix of individual and pair work.
 - These assignments will be posted on the class website.
 - Work grades will be based on how well the required tasks were performed.
 - Late assignments will be accepted up to a week after the deadline with a penalty.
- Projects:70%

- Each marking period will conclude with a larger scale project.
- Projects must be done in groups of 4, with one member designated as the Project Manager.
- There will be some class time devoted to projects, but they will require outside time as well.
- Continuous development as well as participation by all members will be monitored via GitHub logs.

Course Outline:

- **Unit I: Softdev Toolkit**
 - Python review
 - GitHub workflow
 - Using Flask & virtualenv
 - Jinja templates
 - Code review
- **Unit II: Flask Development**
 - Understanding console messages
 - Parsing the request object
 - Using sessions (cookies)
 - redirect & url_for in python and templates
 - flash for one-time messages
- **Unit III: Relational Databases & SQLite**
 - Benefits of databases
 - Explanation of relational databases, examples.
 - Using SQLite
- **Unit IV: Building a Project**
 - Creating a Design Document & Submitting it for review.
 - Using css (covered during project development).
 - Effective project demos
- **Unit V: Front-End HTML frameworks**
 - Why use a front end framework?
 - Foundation & Bootstrap as examples
 - Costs & benefits of javascript libraries.
- **UNIT VI: Restful APIs**
 - What is a web API?
 - How to make web requests in python
 - Research & Share Rest APIs.
 - Project: Using 2 or more Rest APIs
- **Unit VII: Javascript**
 - Client side scripting.
 - Basic in-line javascript
 - Using javascript to manipulate the DOM
 - Using Ajax to send & receive data via javascript
 - Final Project