CUNY Tech Prep 2016-2017: Technical Curriculum Overview

Subject to Change

Program Overview

The CUNY Tech Prep program provides exceptional CUNY Computer Science students with in-demand software development skills. The technical curriculum will focus on the elements of Full Stack Web Development, from the design and architecture of applications, through the implementation, testing, and deployment of applications. At each stage, the course will focus on applying the tools, concepts, and processes—such as Git, testing, CI/CD, agile development, etc.—used in industry today. At various points throughout the year, industry partners will be invited to guest lecture on topics and to provide insights into industry practices as well as to give students feedback on their technical and professional development.

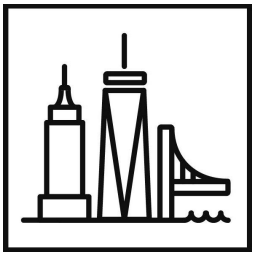
Students will work on *building a portfolio* of applications utilizing skills learned in the course and which they will be able to showcase to employers. Students will work on both individual and group projects and can expect to *provide regular project updates and presentations*. There will be regular *quizzes* (via HackerRank or another platform), and students are expected to *attend weekly lectures and labs*.

Absences

- An unexcused absence is grounds for removal from the program.
- An absence can only be excused by your instructors and/ or program manager.
    - Under extenuating circumstances, notify your instructors and program manager immediately.
    - Planned absences should be requested to the *program manager* at least 7 days in advance.

Projects and Homework

- Homework will be regularly assigned and must be completed by the due dates.
    - Failure to complete assignments is grounds for removal from the program.
- Progress on projects is expected at regular intervals.
    - Failure to show project progress is grounds for removal from the program.
- Group Projects
    - All group members are expected to make contributions.
    - Groups will be assessed as both teams and individuals.

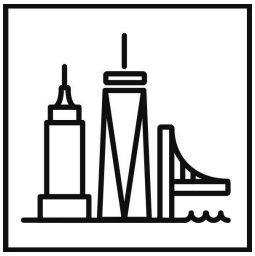


The Tech Stack

- Frontend Technologies
    - HTML + CSS (Bootstrap)
    - JavaScript [client-side] (JQuery)
    - *Extra:*
        - React.js
- Backend Technologies
    - JavaScript [server-side] (Node + Express)
    - Postgresql
    - Java (Play Framework)
    - MongoDB
- Development Environment/Tooling
    - Linux OS (Vagrant VM)
    - Git (Github)
    - Heroku (or other cloud VM providers)

Full-Stack Topics: The frameworks we will use in this class are the Node+Express Framework and the Play Framework. The topics covered will be:

- MVC (Model-View-Controller) pattern
- Templating
- Routing
- ORM (Object Relational Mapper) / Data Mapper pattern
- Basic SQL
- Testing (Unit, Integration) / Continuous Integration
- Application Deployment



Summer Pre-Work

- Session 1
  - Introduction to the course
  - Linux OS basics
    - Environment: Ubuntu Vagrant VM
    - Common Bash commands, Apt-Get package management, Filesystem
    - Network basics/tools: IP's, ports, URL's
  - Intro to Git/Github
  - Intro to JavaScript
  - Homework
    - Self-paced JavaScript class
    - Self-paced HTML/CSS class
    - JavaScript problem set
- Session 2
  - Review JavaScript problem set
  - HTML5/CSS Introduction/Review
  - Bootstrap Framework
  - JQuery Framework
  - Homework
    - Create and Publish a Personal Static HTML/CSS/JS webpage
    - Must use Github for source code
    - Self-paced Java 8 class/tutorial
    - Java 8 problem set