

hash:code

BOOTCAMP

Detailed Curriculum & Structure

Status	Draft
Last update	April 26 th , 2013

Part One - Overview

After finishing the **Part One** a bootcamper should:

1. attain a productive comfort level with Linux/Unix command line tools.
2. understand purpose and use cases of the revision control system and use basic Git functionality with a degree of comfort.
3. understand HTML document structure and the role of CSS.
4. be able to create HTML documents and add styles with a certain degree of comfort.
5. understand role of JavaScript and get comfortable with basic language constructs.
6. understand the role and use cases for JavaScript toolkits in general and jQuery in particular.
7. understand the big picture and how HTML, CSS, JavaScript, and jQuery fit together by building two mini projects of 12 – 15 hours effort during the weekends of Week I and Week II and a minor project of 40 – 50 hours during Week IV.

Calendar

	Week I	Week II	Week III	Week IV
Monday	Linux CLI Tools RCS with Git	HTML/CSS	JavaScript	Minor Project 40 – 50 hours
Tuesday	RCS with Git HTML/CSS Linux CLI Tools	HTML/CSS	JavaScript	
Wednesday	RCS with Git HTML/CSS Linux CLI Tools	HTML/CSS	JavaScript jQuery	
Thursday	RCS with Git HTML/CSS Linux CLI Tools	HTML/CSS	JavaScript jQuery	
Friday	RCS with Git HTML/CSS Linux CLI Tools	HTML/CSS	JavaScript jQuery	
Weekend	Mini Project	Mini Project	Study Assignment	

Part One - Week I

Monday

Linux Command Line Tools

- The Shell – concepts and terminology.
- Files, directories, and file system layout.
- Basic directory operations (`mkdir`, `cd`, `rmdir`, `ls`)
- Basic file operation (`touch`, `cp`, `rm`, `cat`, `less`)

Revision Control System with Git

- RCS – concepts, terminology, and use cases.
- Creating a project (`git init`)
- Checking status (`git status`)
- Adding new files (`git add`)
- Committing files to repository (`git commit`)
- Checking log (`git log`)

Tuesday

Linux Command Line Tools

- Streaming files.
- Pipes and redirection.
- Wildcard matching.

HTML/CSS – First Step

- Terminology – Elements, Tags, and Attributes.
- Document Structure & Syntax.
- CSS Terminology – Selectors, Properties, and Values.
- CSS Structure & Syntax
- Selector Types – Classes, IDs
- External CSS
- CSS Resets

Wednesday

Linux Command Line Tools

- Finding files (`find`, `dir -r`)
- Finding stuff inside files (`grep`, `select-string`)
- Getting help (`man`, `info`)
- Finding help (`apropos`, `HELP`)

HTML/CSS – Elements & Semantics

- Block level & inline elements, (`div`, `span`)
- Typography semantics & elements (`h1 - h6`, `p`, `strong`, `em`)
- Basics font declarations and styles.
- Hyperlinks – within the document, external documents, files, & media.

- Relative & absolute paths.
- HTML5 structural elements (header, footer, article, section, aside, nav)
- Ordered, Unordered, & definition lists (ol, ul, dd/dd/dt)
- Images, audios, videos, etc.
- Organizing data with tables.
- Gradients & Backgrounds.
- Don't Repeat Yourself – The DRY Principle.

Thursday

Linux Command Line Tools

- Understanding the environment and environment
- Environment variables (env, echo, Env:)
- Changing the environment (export, Env:)
- Practice, Practice, Practice.

HTML/CSS – The Box Model

- Box Sizing
- Height & Width
- Margin & Padding
- Borders
- Floating Elements & Clearing floats
- Positioning & Box Offsetting

Friday

Week Recap

Weekend

Mini Project

Build a small website for your favorite artist, band, author, or any personality utilizing the knowledge gained in Week I.

Effort: 12 – 15 hours.

Part One - Week II

Monday

Instructor Led Postmortem Of Weekend Project

Instructors work with the students and weekend project is taken apart piece by piece. Instructors help and *nudge* students to identify parts that can be improved and find a better way to implement those parts – taking detailed notes along the way.

Tuesday

HTML/CSS – Detailed Positioning

- Floats techniques – containing, overflows, clearfix.
- Positioning – relative, absolute, fixed.
- z-Index

Wednesday

HTML/CSS – Complex Selectors

- Common Selectors
- Child Selectors
- Sibling Selectors
- Attribute Selectors
- Pseudo Classes & Elements

Thursday

HTML/CSS – Responsive Design

- Responsive Design Overview
- Understanding The Viewport
- Flexible Layouts
- Media Queries
- Mobile First Design
- Flexible Media

Friday

Week Recap

Weekend

Mini Project

Continue improving on the project built in Week – I, utilizing the knowledge gained during this week. Add a mobile site design for various viewport sizes.

Effort: 10 – 15 hours.

Part One - Week III

Monday

Instructor Led Postmortem Of Weekend Project

Instructors work with the students and weekend project is taken apart piece by piece. Instructors help and *nudge* students to identify parts that can be improved and find a better way to implement those parts – taking detailed notes along the way.

Tuesday

JavaScript – First Step

- Introduction & overview of language features.
- Understanding JavaScript viz-a-viz other programming languages.
- Values, variables, & control flow
- Functions, arguments, & scoping rules

Wednesday

JavaScript – Data Types & Structures

- Objects and Properties
- Arrays
- Arrays vs Objects
- Properties on various data types
- JavaScript - Browser Context
 - Introduction of DOM & BOM
 - Introduction to browser events
 - Manipulating elements with pure JavaScript

jQuery – The Basics

- The jQuery object & The Mighty \$
- Finding elements and getting element references
- Working with an element and a collection of elements
- Working with element attributes
- Method chaining

Thursday

jQuery

- Traversing the HTML document
- Manipulating the elements and collection of elements
- Adding, removing, & copying elements
- Finding and using quality jQuery plugins.
- Listening and responding to events

Friday

Week Recap

Weekend – Study Assignment

HTML, CSS, JavaScript, jQuery

- Error Handling
- Object Oriented Programming
- Modularity
- Advance BOM, DOM
- Basic Performance optimization of HTML, CSS, JavaScript, and jQuery
- How to use various jQuery effects
- Using Ajax

Effort: 10 – 12 hours.

Part One - Week IV

Minor Project

Delete all source code files for the project built during the last three weeks and start over. Utilize all the knowledge gained during Part One.

Effort: 30 – 40 hours.

Part Two - Overview

After finishing the **Part Two**, a bootcamper should:

1. attain a productive comfort with intermediate level Git usage.
2. understand purpose and use cases of various types of data stores and use them to manipulate data with comfort.
3. attain an intermediate to advance level knowledge of Python language features.
4. be able to setup a Linux server, manage users and permissions, and configure various network services.
5. understand MVC pattern and use Django to build decently complex web application.
6. be able to think in terms of complete web app instead of individual moving parts.
7. understand Agile methodologies and processes.
8. understand and apply various cloud computing concepts in real life projects.

Calendar

	Week I	Week II	Week III	Week IV
Monday	Data Stores RCS with Git	Python Linux Sys Admin	Django SASS/Less Agile Without Jargon	BOOTCAMP REVISION PROJECT PREPARATION SOFT SKILLS
Tuesday	Data Stores RCS with Git	Python Linux Sys Admin	Django Agile Without Jargon	
Wednesday	Data Store RCS with Git	Python	Django Cloud Computing Agile Without Jargon	
Thursday	Data Stores Linux Sys Admin	Python Django	Django Cloud Computing	
Friday	Data Stores Linux Sys Admin	Python Django	Django	
Weekend	Mini Project	Mini Project	Study Assignment	

Part Two - Week I

Monday

Data Stored – RDBMS

- Recap of RDBMS & SQL
- Creating databases and tables
- Inserting, updating, and deleting rows
- Introduction To Keys & Indexes

Revision Control System with Git

- Introduction to Branches
- Basic Branching & Merging

Tuesday

Data Stores – RDBMS

- Schema Design Best Practices
- Understanding & Using Joins

Revision Control System with Git

- Branch Management
- Branching Workflows

Wednesday

Data Stores – RDBMS

- Aggregations
- Understanding Query Performance
- Difference Between SQLite, PostgreSQL, and MySQL

Revision Control System with Git

- Rebasing
- Stashing
- Introduction To Distributed Workflows

Thursday

Data Stores – NoSQL

- Non Relational Data Stores – Concepts & Use Cases
- Understanding Documents, Objects, Keys, & Values
- Insert, Retrieve, Update, and Delete
- NoSQL Data Design Best Practices

Linux System Administration

- Users, Groups, & Permissions
- Basic Process Management

Friday

Data Stores

- Setting Up Data Stores
- Users, Roles, & Permissions
- Performance, Tweaks, Logs, & Query Analysis

Linux System Administration

- Basic Linux Networking
- SSH & Related Tools

Weekend

Mini Project – Decided Individually.

Effort: 12 – 15 hours.

Part Two - Week II

Monday

Python

- Data Types
- Control Flow
- Tuples, Lists, & Dictionaries
- Functions

Linux System Administration

- Linux Security Basics
- Public Key Authentication With SSH
- Firewall Basics

Tuesday

Python

- Classes and Objects
- Decorators

Linux System Administration

- Process Management & Monitoring with upstart, supervisor, etc.
- Configuring & Managing Network Services

Wednesday

Python

- Generators
- Iterators
- Automated Testing Basics

Django

- Recap of HTTP & Other Protocols in TCP/IP Stack
- Django – What & Why
- Understanding Model View Controller Pattern
- Understand & Using Object Relational Mapper & Active Record Pattern

Thursday

Python

- A Guided Tour of Standard Library

Django

- Basic Views & Templates
- The Admin Site

Friday

Week Recap

Weekend

Mini Project

Build a polls application in Django.

Effort: 10 – 15 hours.

Part Two - Week III

Monday

Django

- Advance Models, Managers, & QuerySets

CSS Preprocessors – SASS/Less

- Introduction to SASS & Less
- Basic Syntax & Feature Overview
- Variables, Mixins, & Calculations

Agile Without Jargon

- The What & The Why
- Common Concepts Across Scrum, Kanban, XP, etc.

Tuesday

Django

- Designing An Intuitive URL scheme
- Class Based Views
- Request/Response

Wednesday

Django

- Forms & File Uploads

Cloud Computing

- The What & Why
- Platform As A Service, Infrastructure As A Service, Software As A Service, etc.
- Introduction To Amazon Web Services, Google App Engine, Google Compute Engine
- Content Delivery Networks
- Understanding Cloud Performance

Agile Without Jargon

- Communicating With Clients
- Status Updates and Stand Ups

- Time Management & Tracking

Thursday

Django

- Guided Tour of most used Django features
- Django Third Party Ecosystem

Cloud Computing

- Unguided Lab Practice

Friday

BootCamp Recap

Weekend – Study Assignment

Revision of Part Two

Effort: 10 – 12 hours.

Part Two - Week IV

Revision of Last Seven Weeks

Preparing For The Project

Language & Communications

- English Language Skills for Programmers & Designers
- Writing Effective Emails
- Writing Usable Documentation – Language & Tools

Professional Social Skills

- Business Ethics
- Collaborating With FOSS Communities – Methods & Etiquettes
- Finding Help When Stuck

Life Skills

- Striking The Balance Between Personal & Work Life
 - Worrying Solves Nothing – Keeping Calm In High Pressure Situations
-

Part Three

Part Three consists of a major project of 120 – 150 hours effort touching/using all major skills acquired during previous eight weeks.