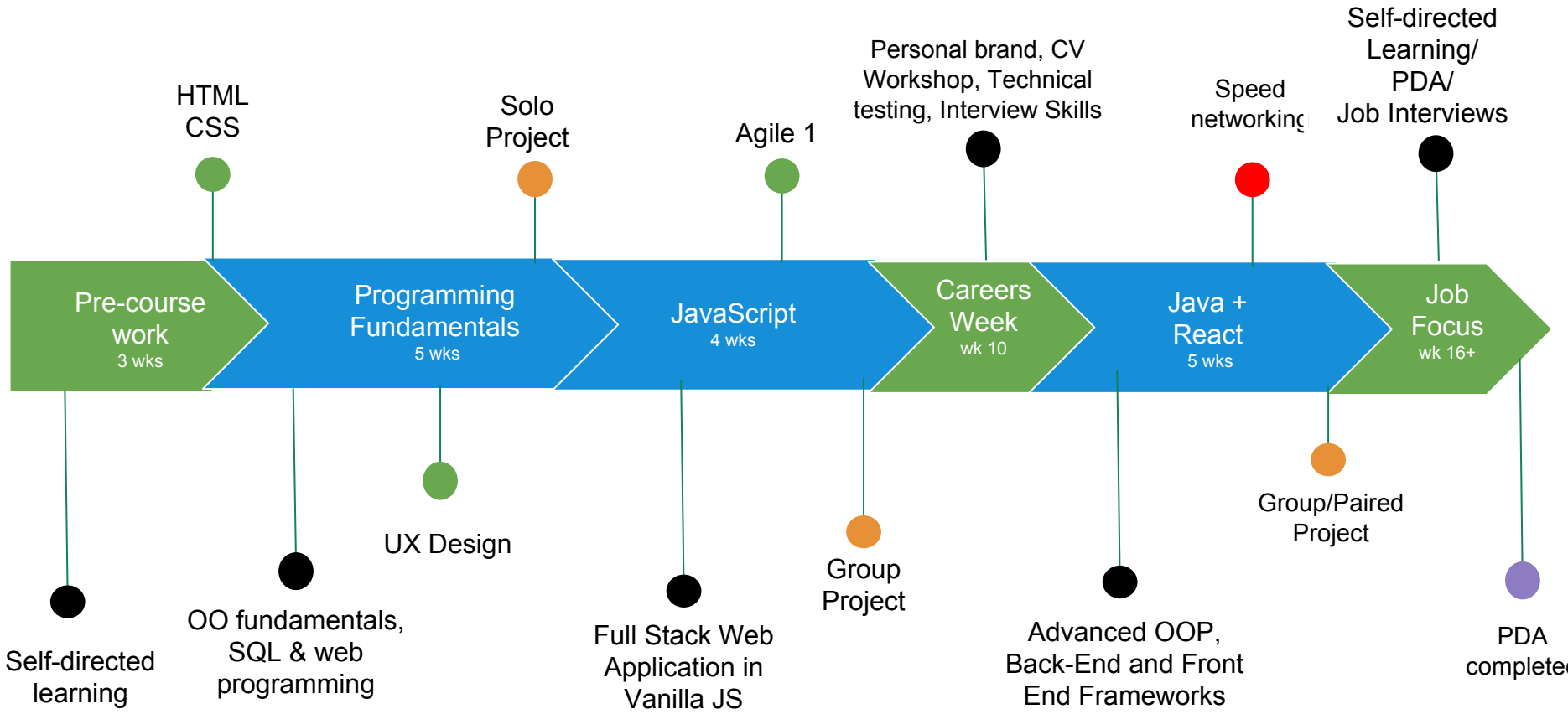
Professional Software Development Programme - 2018



Admission to Course

Pre-course work

Learning Outcomes:

1. Know and understand basic terminology relating to software development;

2. Understand some of the basic concepts of programming using Ruby

3. Understand basic Terminal commands

4. Understand basics of HTML and CSS

Wk 1: Computer Familiarity

Focus:
- Computer familiarity*
- Terminal & command line
- Git and Github

Learning Objectives:

Know how to use simple Mac commands and programming tools.

Understand how the command line works and can help us as programmers.

Be able to use the command line to perform basic tasks.

Wk 2: Programming Fundamentals

Focus:
- Ruby
- HTML/ CSS

Learning Objectives:

Understand basics of HTML & CSS

Understand how some basic programming concepts can be implemented using Ruby.

Be able to write some basic functions using Ruby.

Wk 3: Programming Fundamentals

Focus:
- Ruby
- HTML/ CSS

Learning Objectives:

Know basic terminology relating to Ruby programming.

Understand how HTML & CSS are used to structure a web page.

Be able to use some HTML & CSS to create a basic web page.

***Skills practice:** *Students should be working towards achieving a typing speed of 40-50 words per minute for normal typing and 30-40 words per minute for Ruby code by the end of week 3.*

Pre-course work

Programming & Web Fundamentals

Learning Outcomes:

1. Use Ruby, SQL, Sinatra;

2. Know how to structure and construct programs using object-orientation, following best practice

3. Understand how component parts fit together in a program;

4. Be able to develop a web application in a test-driven style.

Wk 1: Programming Fundamentals

Learning Objectives:

Know how to write simple procedural programs using standard development tools.

Understand how testing and test-driven development can help to write better code.

Able to write small unit-tested procedural programs using simple data structures and control flow, making use of standard development tools.

Schedule:
- Induction, Unix & Git
- Functions/conditionals
- Collections & loops
- De-bugging & editors
- Intro PDA

Wk 2: Object Orientation

Learning Objectives:

Know what a class is and the difference between a class and an object.

Understand how and why we use custom classes and objects.

Able to write multiple custom classes that interact with each other.

Schedule:
- Intro to classes
- Multiple classes
- Full day OO lab
- Advanced topics
- **PDA:** evidence

Wk 3: Databases

Learning Objectives:

Know what a database is; explain SQL; know how to use CRUD and create relationships.

Understand standard relationships in a relational database.

Understand how we can persist objects using a database.

Able to construct programs which make use of persistence and relationships.

Schedule:
- SQL
- Single model
- One-to-many
- Many-to-many
- **PDA:** evidence

Wk 4: Web Programming

Learning Objectives:

Know what the request/response cycle is.

Know what the main HTTP verbs are and what we might use them for.

Know the RESTful routes and MVC pattern as applied to web apps.

Understand how to make and respond to requests programmatically.

Schedule:
-Sinatra
- Code along
- UX Design - full day
- **PDA**: planning

Wk 5: Project 1

Solo Project

Able to create a simple RESTful CRUD application backed by a database, following the MVC pattern.

Schedule:
- Project work
- Presentations
- Project reviews
- **PDA:** evidence

Programming & Web Fundamentals

JavaScript

Learning Outcomes:

1. Understand fundamentals of the JS programming language

2. Able to write full-stack JS apps applying OO principles and TDD

3. Understand event-driven programming, higher-order functions and client/server architecture

4. Able to traverse and manipulate the DOM

Wk 6: JavaScript Fundamentals

Learning Objectives:
Know how to write test-driven JS programmes

Understand the fundamentals of the JavaScript language (including callbacks, enumeration, scope, context)

Able to use fundamental software needed to write JavaScript (e.g. Node, NPM, Mocha)

Schedule:
- Types / functions / scope
- Constructors / TDD
- Callbacks / enumeration
- Intro to DOM
- Event Listeners

Wk 7: Front-end JS

Learning Objectives:
Know how to access data from an external source and display it in the browser in a well structured way

Understand Requests and RESTful APIs

Able to use third-party libraries to display data in a compelling way

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Schedule:
- Intro to Webpack
- Intro to PubSub
- Nested Modular Views
- Making XHR requests
- Fetch and Promises
- **PDA:** evidence

Wk 8: Back-end JS & NoSQL

Learning Objectives:
Able to use MongoDB is to persist data in a web application

Able to use advanced features of Git

Able to build a full-stack web application in JS

Understand how to use Agile methodologies in team project work

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Schedule:
- Express
- Intro to MongoDB
- Full stack app
- Full day lab
- Agile methodologies
- Project definitions

Wk 9 Project 2

Group Project: Full stack JS project:

Create an MVP for an app that allows users to access external data, using APIs.

Schedule:
- Project work
- Presentations
- Project Reviews

- **PDA:** Project Unit evidence & final tests

PDA: Project Unit completed.

JavaScript

Careers Week

Outcomes:

1. Revise CV to highlight key technical and transferable skills and experience

2. Enhance online profile(s) on social media sites

3. Build strong portfolio of project work

4. Be prepared for technical tests and interviews.

Monday

Learning Objectives:
Know what personal branding is

Understand how personal branding can promote skills and engage employers

Able to create personal brand

Schedule:
- Brand of me
- Inspire

Tuesday

Learning Objectives:
Know what the purpose of careers service is. Creating a technical CV

Understand how to create a technical CV to send to potential employers

Able to Revise and update CV to include skills learned throughout the course

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Schedule:
- Intro to Careers service
- CV Workshop

Wednesday

Learning Objectives:
Know what roles are available in the Industry. Understand tech tests.

Understand how to prepare for technical tests at interview stages.

Able to...
Complete a technical test

Schedule:
- Industry Insights
- Technical Tests with Mike Ritchie

Thursday

Learning Objectives:
Know what skills are required for interview

Understand how to prepare for interviews

Able to...
Prepare for interviews

Schedule:
- Interview Skills
- Mock Interviews

Friday

Complete cognitive tests for PDA

Schedule:
- PDA Tests
- CS consolidation

PDA: Cognitive tests completed.

Careers Week

Java

Learning Outcomes:

1. Build applications with Java & Spring

2. Know how to design and construct OO programs using a statically typed language;

3. Understand the fundamentals of a statically typed language;

4. Be able to design and create applications using OO fundamentals following SOLID principles.

Wk 11: Java

Learning Objectives:
Know what a statically typed language is.

Understand how compiled languages differ from interpreted languages.

Able to write, test, compile and run a Java program.

Able to write and unit test Java in Android Studio

Schedule:
- Intro to Java
- Classes, encapsulation,
- Intro to IntelliJ IDE
- Types, hashmaps
- All Day Lab
- Enums and testing

Wk 12: Java

Learning Objectives:
Know what the SOLID principles and 4 Pillars are.

Understand how to build applications following SOLID in Java.

Able to write tests with mocking library; write compile and run well designed Java programs.

Schedule:
- Inheritance
- Abstract Classes
- Interfaces
- Polymorphism
- Composition
- All day lab

Wk 13: Java

Learning Objectives:
Know what the Spring framework is

Understand how to configure Spring and JPA to build back end apps

Able to...
Create a Spring application to persist and serve data as JSON API

Schedule:
- Intro to Spring and JPA
- Annotating a class for persistence
- Creating a Controller + JPA Repository Queries
- All day lab

PDA: I&T Unit completed.

Java

Web Frameworks

Learning Outcomes:

1. Know what a web framework is and how it increases productivity;

2. Understand how to use web frameworks;

3. Be able to utilise web frameworks to speed up development.

4. Be able to create Full stack React app with a Java API backend.

Wk 14: React

Learning Objectives:

Know why frameworks exist.

Understand the virtual DOM and one-way data flow in React.

Able to use ReactDOM to build a front-end app.

Schedule:
- Intro to React
- using forms in React
- Using API's with React
- Full stack React with Java API
- React router

Wk 15: Pair/Group Project

Solo Project:
Choice of project that will meet an MVP for an app that allows users to access data from Java/External API, using Spring and React.

Able to start building an application demonstrating new learning allowing student scope to complete project outside course.

Schedule:
- Project work
- Presentations
- Project Reviews
- Speed Networking
- PDA: evidence

Final Week: Self Directed Learning

Lessons:
Students will have opportunity to attend short optional classes looking at different languages such as Python and C#.

Support:
Students may choose to use a new framework such as Rails for project work.

PDA:
Students may choose to complete PDA work

Job Prep:
Students may choose to focus on Job and career including support or attending interviews.

Throughout course

Professional Development Award

Learning Outcomes:

Completion of all PDA: Software Development Level 8 Units :

1. Analysis & Design

2. Implementation & Testing

3. Project

Programming Fundamentals	JavaScript	Careers Week	Java and React	*Post- Course*
Intro to PDA	Gathering evidence from JavaScript assignments	Review Training & Assessment Plan	Review Training & Assessment Plan	Review of PDA progress
Training & Assessment Plan	Gathering evidence from JavaScript Project	Cognitive tests (A&D and I&T)	Gathering evidence from Java assignments	Gathering, marking and verifying evidence to meet final Outcomes
Checklists & set up GitHub Repo	Planning & diagram lessons	Gathering evidence from Java assignments	Gathering evidence from Java Project	Results submitted to SQA
Resources for Cognitive tests	Unit & Integration testing	Gathering evidence from Java Project	Evidence marked	
Planning lessons	Evidence marked	Evidence marked		
Gathering evidence from Project 1				
Static & dynamic Testing				

SQA

PDA Level 8 Awarded

Employment Support Services

Job Preparation

Outcomes:

1. Revise CV to highlight key technical and transferable skills and experience

2. Enhance online profile(s) on social media sites

3. Build strong portfolio of project work

4. Be prepared for technical tests and interviews.

Self-directed activities

Objectives: to guide students in creating assets to support later job search activities.

- write personal profile for internal CodeClan use and to distribute to industry partners

- revise CV to demonstrate new learning and experience

- create LinkedIn profile

- write Readme files for Git repo to highlight project work completed

- contribute to blogs, twitter feeds, highlighting learning and outcomes

- practice code tests

Job Support

Outcomes:

1. Develop technical CV to reflect CodeClan learning

2. Understand technical test process and preparation

3. Able to write cover letter in response to specific tech job roles;

4. Practice in developing strong interview skills

Supported Activities

Objectives: to give students best chance of gaining employment in tech industry. Includes range of optional scheduled workshops and review sessions. Students should can attend multiple times::

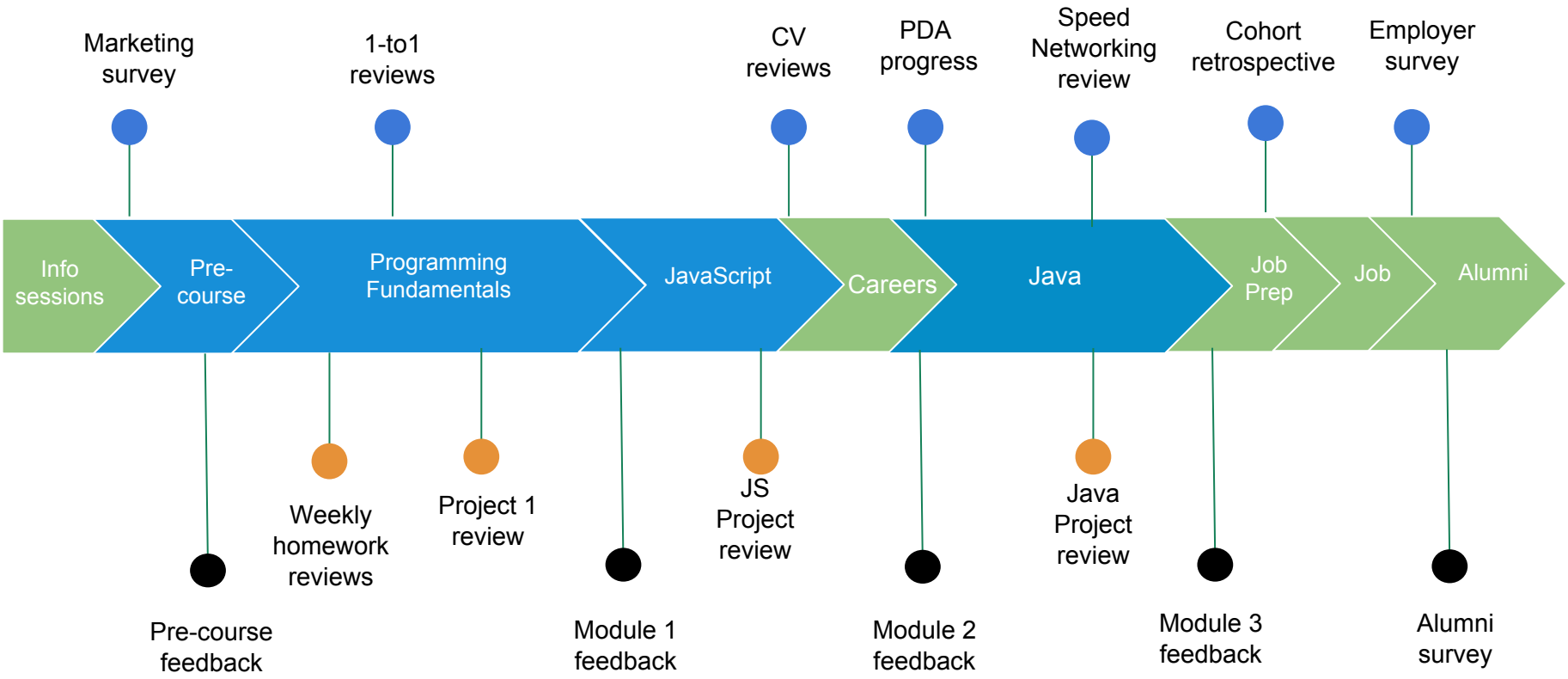
- CV, Cover Letter & Interview Skills workshop

- Technical Test workshop with external expert.

- Individual CV feedback and r review sessions

- Mock interview practice sessions with instructor team

- Code test reviews with instructor team

- work with Employability Manager to secure placement

Student Feedback & Review Cycle