



Factory

Full-Stack Web Development

Bootcamp Syllabus

Version

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Author

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Brief

SE Factory is a non-profit, **3-month intensive** coding bootcamp running at almost no cost to the students, that produces professional full stack web developers with highly competitive technical and soft skills.

With currently 3 batches running per year and plans for expansion, SE Factory empowers students from different backgrounds and parts of Lebanon with the skills to conquer and succeed in the job market, impacting their lives as individuals, their communities, and Lebanon as a whole.

Choice of The Technology Stack

The World Wide Web is the backbone of the Internet and the catalyst of the modern information age. While numerous technologies have emerged in recent years, namely mobile and IoT devices, the web remains the undisputed common denominator. Mobile games, marketing, utilities, service apps and many other categories, all rely on a somewhat centralized web based back-end to operate at full capacity.

The LAMP (Linux, Apache, MySQL and PHP) stack is at the core of SE Factory's curriculum. We have sampled information from prominent tech companies in the Lebanese market and have found that the LAMP stack (or some variation of it) is still the dominating choice for a number of reasons (research to be published as part of a subsequent document). While Ruby, Python and Node are making an appearance, the demand for developers experienced in these technologies is still low.

With that said, SE Factory strives to teach and augment students' **problem solving** and **solution engineering** capacities. Our teaching methodology is **technology agnostic**. For us, and by association our students, languages, databases, servers and other elements of the existing technology stacks are simply tools which the craftsman employs in the delivery of reliable solutions abiding by modern industry standards.

SE Factory alumni are currently holding Software Engineering positions at **11 local tech companies and startups**. They've easily adapted to their companies' technical needs and are working as front-end (Angular, React), mobile (iOS and Android), back-end (Java-EE, .NET, php) developers. They continue to impress their employers with their acquired unique autonomy in analyzing, researching and building solutions.



Lectures	16	32 hours	
Projects	20	~480+ hours	<i>Expect to do some work / studying in the weekends</i>
Workshops	24	48 hours	

Week #1 – Welcome aboard, let's get our hands dirty

Duration	(40)	Hours
Lectures	(2)	
Assignments	(3)	

Topics Covered

- **Introduction to the World Wide Web**
 - o Historical overview
 - o Discussion of HTML, HTTP, W3C, IETF, Net Neutrality
- **Introduction to Cloud Computing**
 - o Evolution and Advantages
 - o Distinction between IaaS, PaaS and SaaS
 - o Hybrid / Private and Public Clouds
- **Linux**
 - o Historical Overview
 - o Distributions and Branches
 - o Terminal vs Shell vs Console, Package Managers
 - o Introduction to Bash shell and Shell Scripting
- **Web Servers**
 - o Apache HTTP Server
 - o Detailed HTTP Protocol Discussion
 - o Request / Response Lifecycle
 - o Setup and Configuration
- **Virtualization**
 - o Setup and Configuration of Virtual Machines

Week #2 – Let's get organized

Duration	(40)	Hours
Lectures	(2)	
Assignments	(2)	

Topics Covered

- **Source Control with git**
 - o Historical overview
 - o Importance of Source Control
 - o Discussion of git & BitBucket
- **Object Oriented Programming with PHP**
 - o Recap of Object Oriented Programming theory
 - o Discussion of the OOP implementation in PHP



Week #3 – Relational Databases

Duration (40) Hours
Lectures (2)
Assignments (1)

Topics Covered

- **Relational Database Theory Refresher**
 - o Intro to Relational Databases
 - o Discussion of Desired Database Features
 - o Relations, Attributes, Tuples
 - o Constraints
 - o Database Operations
 - **MySQL**
 - o Historical Overview
 - o MySQL Features
 - o Limitations
 - o Setup and Configuration
 - o Security
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Week #4 – Data Manipulation

Duration (40) Hours
Lectures (2)
Assignments (3)

Topics Covered

- **MySQL Part #2**
 - o Database Operations Continuation
 - o Relations, Attributes, Tuples
 - o Constraints
 - o Database Operations
- **MySQL Part #3**
 - o Data Aggregation
 - o Joins
- **PHP and MySQL – Connecting the Dots**
 - o MySQL Users and Privileges
 - o Querying



Week #5 – What happens when you open a URL in the browser?

Duration (40) Hours
Lectures (1)
Assignments (2)

Topics Covered

- **Front-End / HTML, CSS Introduction**
 - Browsers & Under the hood Operation
 - HTML 5 Semantic Elements, Tags and Attributes
 - DOM
 - Cascading Style Sheets (CSS) Declarations
 - CSS Inheritance
 - Selector Types, choices, and best practices
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Week #6 – Learn to love the good parts of Javascript!

Duration (40) Hours
Lectures (2)
Assignments (3)

Topics Covered

- **Javascript**
 - Language Overview
 - Discussion of ECMAScripts
 - JS Grammar
 - JS Expressions, Operators, Statements and Declarations
 - JS Objects, Prototypes
 - Functions and Invocation Patterns
 - Exceptions
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Week #7 – Let's get one level higher in abstraction

Duration (40) Hours
Lectures (1)
Assignments (1)

Topics Covered

- **PHP Dependency Management**
 - Composer
 - Autoloading
- **MVC Pattern**
 - Model / View / Controller Discussion
- **PHP Namespaces**
- **Advantages of using Frameworks**



Week #8 – Laravel is your friend

Duration (40) Hours
Lectures (1)
Assignments (1)

Topics Covered

- **Laravel**
 - Historical Overview
 - Folder Structure and Main Features
 - MVC Implementation in Laravel
 - HTTP Request / Response Cycle in Laravel
 - Artisan

Week #9 – More Practice

Duration (40) Hours
Lectures (0)
Assignments (1)

Week #10 – RESTful APIs are the infrastructure of the web

Duration (40) Hours
Lectures (2)
Assignments (2)

Topics Covered

- **RESTful APIs**
 - General Discussion of the REST Architecture
 - REST Features
 - API Design Best Practices
- **Web Application Security**
 - Discussion of Offensive / Defensive Practices
 - Discussion of Attack Vectors, Vulnerabilities, and Countermeasures
 - Discussion of Common Web Attacks



Week #11 – Harness the power of AWS products

Duration (40) Hours
Lectures (1)
Assignments (1)

Topics Covered

- **AWS & Cloud Architecture**
 - Modern Architectural Patterns
 - Regions and Availability Zones
 - Pricing Models
 - AWS Management Console
 - AWS IAM, EC2, AMIs, S3, EBS, RDS,
 - git Hooks and Deployment

Week #12 – Unleash your creativity!

Duration (40) Hours
Lectures (0)
Assignments (0)

Final Project Delivery

Week #13 – Let's promote your knowledge to the world

Duration (40) Hours
Lectures (0)
Assignments (0)

Final Project Delivery



Guest Technical Workshops

Throughout the program, we host a number of prominent and influential CTOs, Technical Managers, and Senior Developers from the local community to share technical or industry related insights with our students. Some workshops topics are listed below to give you an idea of what to expect.

- Unit Testing with PHPUnit
- git Workflows, Best Practices and Branching Models
- Explore the power of vim
- Intro to event-driven, async programming with Node.js
- Software Engineering Overview
- IoT Data Aggregation into the Cloud
- Code Analysis and Maintainability
- Building, Releasing and Maintaining Open Source Projects
- Continuous Integration
- Academia vs Industry, which path to choose?
- Scaling Web Applications
- Building Enterprise Solutions