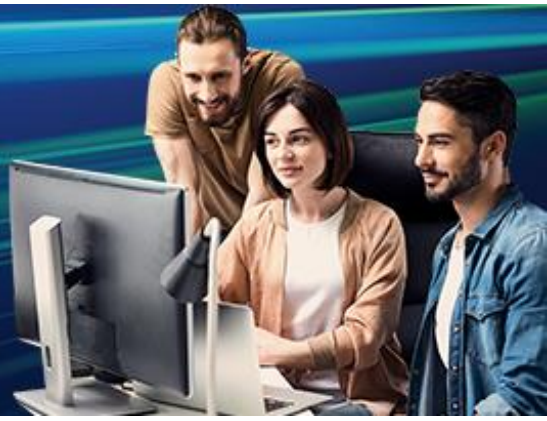
Cognizant Academy

# Full Stack Prep-up Learning Guide Java Track



## Why do we need this Full Stack Prep-up Internship Program?

Full Stack Prep-up Internship program engages young talents with a comprehensive learning pathway, giving these millennials an opportunity to become a Full Stack Engineer, understand the corporate environment and groom themselves even before they join us.

Cognizant emphasizes on Learner Autonomy where students take charge of their own learning pathway, with the available tools and resources. More focus is given to “learning” than “teaching”.  Get ready to embark your own learning adventure!

## Program at a glance

Full Stack Prep-up Internship Program has 3 stages:

- Stage 1 (Week 1 – Week 3)
- Stage 2 (Week 4 – Week 6)
- Full Stack Prep-up Modules (Week 7 – Week 16)

## Program Highlights

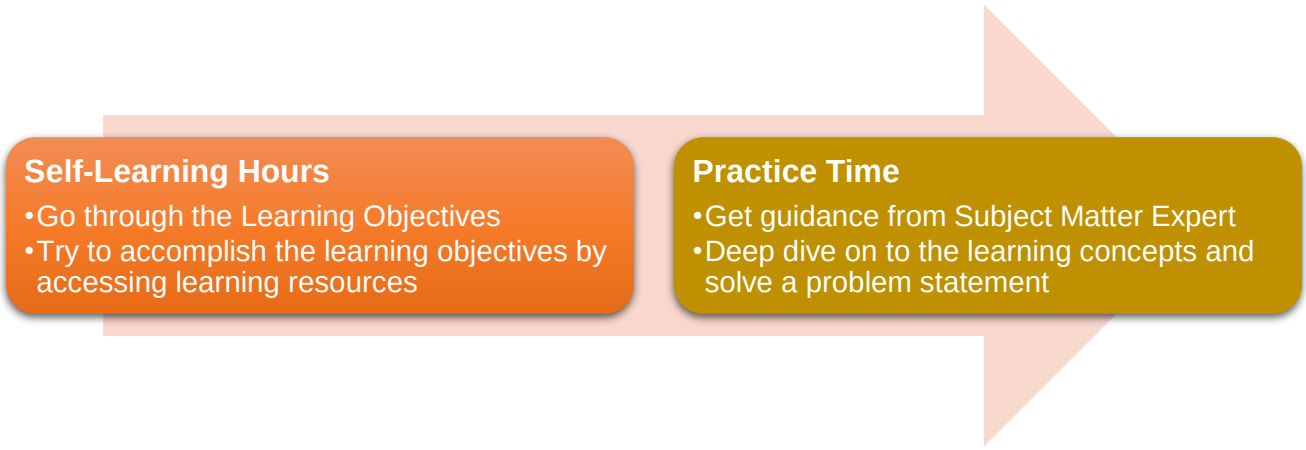
- The complete learning journey is formalized using adult learning principles, where problem solving and applying the skills gained are given more importance than conceptual learning.
- Learner Autonomy is implemented via Flipped Classroom, where the learning platform offers world class learning resources, and students would not be constrained by tutelage of an instructor.
- Get mentored by Subject Matter Experts, whose motivation and guidance will help you accelerate in the learning journey.

# Learning Journey with Flipped Classroom

This program encourages you to be more autonomous learners during out-class self-learning hours, completing the learning objectives on your own pace and style, and get ready for the in-class practice time.

The complete learning path from Stage 2 onwards, is set in the GEN C Learn Platform, which you can login with SSO.

## Flipped Classroom

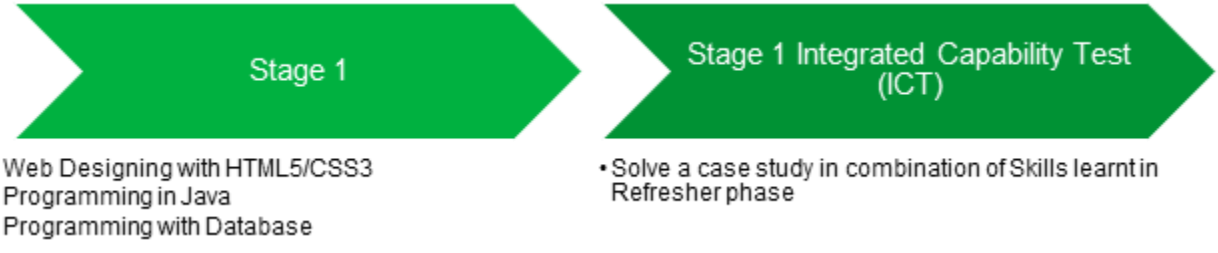


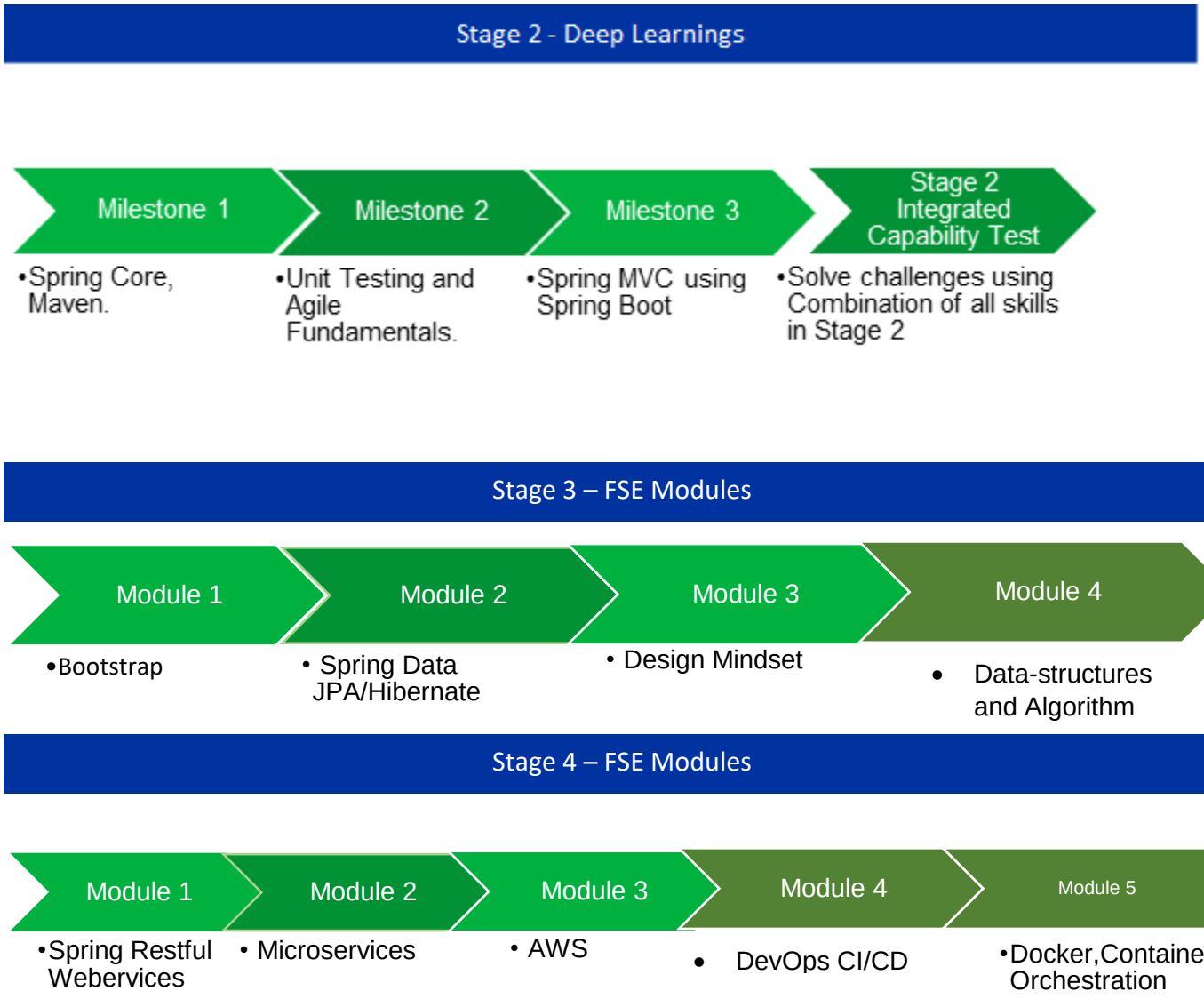

# Recommended Program Sequence

The learning journey contains 3 stages:

- Stage 1 – Core Programming Fundamentals
- Stage 2 – Deep Learnings
- Stage 3 & 4 – FSE modules
- My First Pod Engagement – Project Case study done as a team

## Stage 1 - Core Programming Fundamentals






This stage would be executed with complete trainer guidance outside of the Tekstac platform. The software's on the local machine will be used to work on the enablement and case study requirements. The modules in this stage would follow a model of Enablement through Objectives (not thru Udemy), practice through Hands-on question.

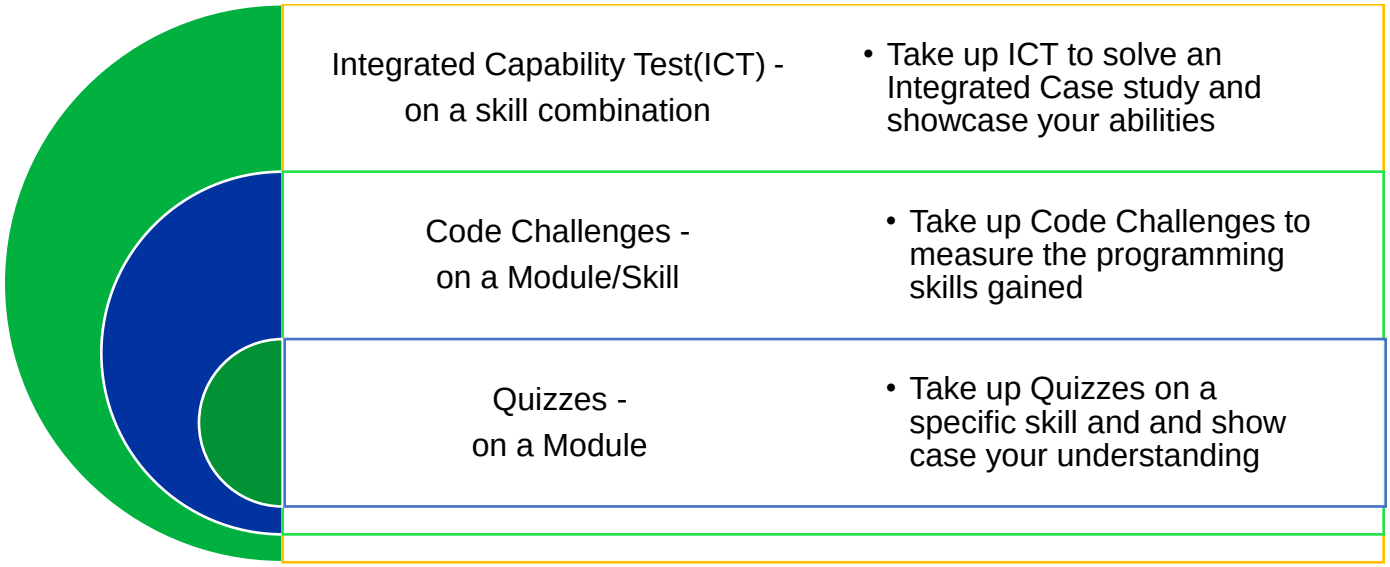
As part of the knowledge check, there would be case studies, as provided in the previous stages. It is split into Practice check and Final check. The case study in Practice check would be done with complete trainer guidance. The case study in Final check would be very similar to that of the Practice check. The participant will implement it without the trainer support.

# Key Learning Components of the Program

Cognizant has partnered with Udemy to provide world class learning videos for the evolving future of work. These videos are tailored in the learning path, empowering you to plan and learn at your style.

The program also connects you with Subject Matter Experts to get the professional guidance on your queries in the learning journey.

The program continuously evaluates if you are able to apply those self-learnt skills to solve a business problem. Depicted below are the 3 key learning components, which are distributed across the learning journey that does the continuous evaluation.




# Program Completion Criteria

Complete all the mandatory Coding Challenges and ICT with benchmark of 70% in both the stages. Coding challenges will be scheduled on the last day of the Milestone.
ICT will be scheduled on the last day of the Stage.

# Stage 1: Milestone 1

**Overall Duration:** 5 days

Milestone 1 will be focusing on HTML, CSS and JavaScript along with behavioral skills*

Udemy learnings are recommended in the Platform to understand the fundamental concepts. Apply the concepts learned and solve the Hands-on and Practice Case studies as recommended below.

## Day 1, 2

Note: Behavioral skills will be covered in this week for 3 hours.

### HTML5, CSS3

Learn the basics of HTML5 & CSS3

**Learn and Practice:**

Responsive Web Design: HTML5 + CSS3 for Entrepreneurs 2018

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Lets Learn Some HTML 5
  - CSS3 & First Project
- Implement the examples along with the author.

Devtools Pro: The Basics of Chrome Developer Tools
Visual Studio Code Features

- Learn the sections listed below in this Udemy course

Go through the below topics to enhance the learning.

- RWD Introduction
- Media Queries
- HTML5 Events
- HTML5 - Geo location
- HTML5 - Web Storage
- HTML5-Web SQL Database
- WEB Forms 2.0

**Mandatory Hands-on (Platform: Tekstac)**

- Simple Calculator
- Learning Material Styling
- Feedback Details
- Bill Calculator
- Trainer Feedback Rating Chart

**Additional Hands-on**

- Rate Card For Boat Riding

# Day 3

## JavaScript

Learn the basics of JavaScript

**Learn and Practice:**

Javascript basics for beginners

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Getting Started
  - Basics
  - Operators
- Implement the examples along with the author.

Go through **W3Schools** web pages for learning below specific topics

Form Validation

- JavaScript Form Validation
- JavaScript can validate numeric input
- Data Validation

String Methods

- String Length
- The substring() Method
- String.trim()

JavaScript HTML DOM

- The HTML DOM (Document Object Model)
- What is DOM?
- What is the HTML DOM?

Window alert() Method

- Definition and Usage
- Example

Javascript Arrays

- All topics except Associative Arrays

JSON

Regular Expression

isNan() function

indexof function

Go through **javascript-coder.com** web page for learning form submission

javascript-coder.com

JavaScript Form Submit Example

- Refer code example in this web page

**Mandatory Hands-on (Platform: Tekstac)**

- ACTB Connection Portal
- EMI Calculator

**Additional Hands-on**

- Fixed And Reducing Interest Loan Estimator

**Technical Quizzes:**

- Quiz 1 - HTML 5 & CSS3
- Quiz 2 - Java Script

## Day 4

**Practice Case Study**

- Understand truYum use cases (truYum-use-case-specification.pdf)
- Go through Web UI specification of truYum (truYum-html-css-javascript-specification.pdf)
- Develop web pages using HTML, CSS and JavaScript for truYum

## Day 5

**Assess-Type-1: Code Challenge (Platform: Tekstac)**

- All code challenges

# Stage 1: Milestone 2 - Schedule

**Overall Duration: 3 days**

Milestone 2 will be focusing on **SQL Programming**

Udemy learnings are recommended in the Platform to understand the fundamental concepts. Apply the concepts learned and solve the Hands-on and Practice case study as recommended below.

## Day 6

Note: Behavioral skills will be covered in this week for 3 hours.

Database design

Relational Database Design

- Learn all the sections in this Udemy course

DDL Commands, DML Commands

**Learn and Practice:**

Sql for beginners

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Installation and Setup
  - Data Definition Language
  - More On Alter Table
  - Data Manipulation Language
  - Selecting from a Table

**Mandatory Hands-on (Platform: Tekstac)**

- Insert Records - Department
- Department name based on block number
- Delivery Partner details based on rating
- Car & owner details based on car type
- Hotels that took order based on month

**Additional Hands-on**

- Car rental system - Create Table
- Car rental system - add new column
- Hunger eats - change datatype
- Hunger eats - Change the field name

# Day 7

## Database design

Operators, Aggregate, String, Date Functions, Joins, Sub queries

**Learn and Practice:**

Sql for beginners

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Selecting From Multiple Tables
  - Database Design
  - Aggregate Functions
  - Subqueries
  - MySQL Functions – String Functions and Date Functions

**Mandatory Hands-on (Platform: Tekstac)**

- Student and their Department Based on City
- Concatenating Details
- Password generation
- Customers using HDFC BANK
- Rental details based on date
- car rental system - Insert values
- Hunger eats - update table
- Customers having gmail id
- Car details based on type and name
- Hotel_info

**Additional Hands-on**

- Total sale daywise
- Hotels not taken orders in a specific month
- Hotels that took order more than five times
- Maruthi car owner details
- Cars not taken for rent
- Customer mail details
- Order details
- Buses based on source and destination
- Number of tickets booked
- No of time rented by each car
- Credential details

**Technical Quizzes:**

- Quiz 1 - Database concepts

- Quiz 2 - ANSI SQL

## Day 8

**Practice Case Study**

- Implement SQL specification of truYum

**Additional learning**

- Please go thru the links on **SQL Rank function** and **Introduction to NoSQL** in the platform

**Assess-Type-1: Code Challenge (Platform: Tekstac)**

- All code challenges

# Stage 1: Milestone 3 - Schedule

**Overall Duration (including Behavioral Modules):** 8 days

Milestone 3 will be focusing on Java Programming along with behavioral skills*

Udemy learnings are recommended in the Platform to understand the fundamental concepts. Apply the concepts learned and solve the Hands-on and Practice Case studies as recommended below

**Note:**

Recommended Hands-on needs to be completed.

**Additional Hands-on** can be taken up for better understanding on the concepts based on the availability of time.

## Day 9

### Core Java

**Continuous Learning: Technical Enablement**

Overview, First Java Program, Variables, Datatypes, Literals, Operators, Expressions and Conditional Statements.

**Learn and Practice**

Java In-Depth: Become a Complete Java Engineer!.

- Java: A High-level Overview
- Skip installation steps.
- Implement the HelloWorld Program along with the author.

Core Java Made Easy.

- Datatypes, Literals, Variables, Type Conversion, Casting & Promotion
- Operators and Assignments
- Flow Control Statements
  - Flow Control Statements Introduction
  - IF-ELSE
  - Assignment 2: If Else Ladder

* Please refer the link for providing the user inputs from the console for Java samples.

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Display Characters
- Fuel Consumption Calculator
- Highest Placement

**Additional Hands-on**

- Bill Generation
- Movie ticket calculation

## Continuous Learning: Technical Enablement

Overview, String, Arrays, Looping Statements, Methods, Class, Object, static.

**Learn and Practice**

Core Java Made Easy.

- Flow Control Statements
  - Switch,While,Do-While,For Loop, Break, Continue
- Static Members and their execution control flow.
- Non-Static Members and their execution control flow.

Java In-Depth: Become a Complete Java Engineer!.

- Classes, Objects and their Members.
  - Chapter Introduction
  - Class & Objects

Core Java Made Easy.

- String Handling
- Arrays

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Least offer
- String Concatenation
- Ticket Price Calculation – Static
- Student Details - Constructor

**Additional Hands-on**

- Increment Calculation
- Find Average Age

# Day 10

## Core Java

### Continuous Learning: Technical Enablement

Access Modifiers, Packages, Inheritance, Abstraction.

#### Learn and Practice

Go through below mentioned sections and implement the examples along with the author.

Core Java Made Easy.

- Access Modifiers
- Packages
- Event Management Use case
- Inheritance
- Abstraction

#### Continuous Learning: Technical Hands-on

#### Mandatory Hands-on (Platform: Tekstac)

- Contact Details of Hosteller
- Account Manipulation - Abstract class

#### Additional Hands-on

- Shape - Area Volume Calculator

#### Additional Learning:

#### Technical Quizzes:

- Quiz - Java Operator, Control flow statement
- Quiz - Applying Object Oriented Concepts in java

### Continuous Learning: Technical Enablement

Polymorphism, Encapsulation, Interface, Object Methods

#### Learn and Practice

Go through below mentioned sections and implement the examples along with the author.

Core Java Made Easy.

- Polymorphism
- Encapsulation
- Object class methods

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- BankAccountDetails
- Employee Loan Eligibility – Polymorphism
- Vehicle-Loan-Insurance - Use Interface

## Day 11

Note: Behavioral skills will be covered in this week for 3 hours.

### Core Java

**Continuous Learning: Technical Enablement**

Collection Framework, ArrayList, Map, Set.

**Learn and Practice**

Go through below mentioned sections and implement the examples along with the author.

Core Java Made Easy.

- Collections with Generics
  - Collections Introduction
  - List Introduction
  - ArrayList Hands On
  - Restricting the ArrayList Type
  - Inserting and Replacing Objects
  - addAll and contains Methods
  - size get and remove Methods
  - Set Introduction
  - Using HashSet
  - Different Set Classes
  - Iterator
  - ListIterator
  - Comparable and Comparator
  - Create a StringBuffer Comparator
  - Sort Strings by Length
  - Sorting Objects
  - Create a Object Comparator
  - Map Introduction
  - HashMap Demo

        - Arrays and Collections Classes
        - Collections Sort
        - Reversing a List
        - Arrays sort()
        - Array to List conversion
        - Generics
        - Generic class structure
        - Create your own Generic Class

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Insurance Bazaar
- Number of New Words
- Phone Book Manipulation

**Additional Hands-on**

- Count of Each Words
- Book Manipulation

**Additional Learning:**

**Technical Quizzes:**

- Quiz - Collections Framework

## Day 12

## Core Java

**Continuous Learning: Technical Enablement**

File Handling, Annotation, Threads and Garbage Collections, Exception Handling, Enums.

**Learn and Practice**

Go through below mentioned sections and implement the examples along with the author.

Core Java Made Easy.

- IO Streams (File IO)
    - IO Streams Introduction
    - Read a File Using FileInputStream
    - Copy A File using FileOutputStream
    - Using Reader And Writer
- Java Annotations
    - Introduction
    - Using @Deprecated
    - Using @Override
    - Using @SuppressWarnings

- Multithreading
- Garbage Collection & Types Of Objects
- Exception Handling and Assertions
- Enums

Go through the below mentioned topics.
String Tokenizer
Number Class
Calendar
Resource Bundle
Currency
Comparable Interface
Math
Class loader
System
Process
Runtime

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Array Manipulation - Use try with multi catch
- Employee Promotion
- Register a Candidate - User defined Exception(with throw and throws)
- Retrieving Data from file

**Additional Hands-on**

- Visitors Details
- Divide two numbers - Use finally

# Day 13

## Core Java

**Continuous Learning: Technical Enablement**

Java 8 Features - Lambda Expressions, Streams, Filters, java.time.

**Learn and Practice**

Go through below mentioned sections and implement the examples along with the author.

Core Java Made Easy.

- Java 8 Features

Java In-Depth: Become a Complete Java Engineer!.

- Date & Time API ~ Covers Java 8 & also Legacy API

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Mall Parking System
- Validate Name
- Travel Agency
- Fruit Basket Estimation

**Additional Hands-on**

- Participant List Manipulation
- College Account

## Day 14

## Core Java

**Continuous Learning: Technical Enablement**

Java 8 Features - Streams and Optionals. Asynchronous and Parallel Programming in Java 8

Go through web pages for learning below specific topics

Serial Sort Vs Parallel Sort
Asynchronous and Parallel Programming
Streams
Optional

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Employee Loan Eligibility
- Placement Enrollment Count
- Auditing

## JDBC

**Continuous Learning: Technical Enablement**

Introduction, Connection, Statement, Prepared Statement, Callable Statement, Transactions and Meta Data.

**Learn and Practice**

Java Database Connection: JDBC and MySQL.

- Go through entire course.
- Implement the examples along with the author.

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Add Flight using JDBC
- Search for Trains – JDBC
- Player Selection System_JDBC

## Day 15

**Additional Learning:**

**Technical Quizzes:**

- Quiz - Advanced Java Concepts

Additional Hands-on

- Retrieve customer count based on loan type_JDBC
- Retrieve ID and Price of mobiles with in the range_JDBC

**Assess-Type-1: Code Challenge (Platform: Tekstac)**

- All code challenges

## Day 16

Note: Behavioral skills will be covered in this week for 3 hours.

TruYum Practice Case Study – Java

# Stage 1: ICT Prep up and ICT.

## Day 17

TruYum Practice case study – JDBC

Mock ICT

## Day 18

**Integrated Capability Test (ICT) (Platform: Tekstac)**

- ICT

# Stage 2: Milestone 1

**Overall Duration (including Behavioral Modules):** 5 days

## Day 19

### Maven

Needs and benefits, Maven Project Creation, POM.xml, Build lifecycle, repositories, Scopes and Profiles.

**Learn and Practice**

Refer this document for Maven Installation and Web Project Creation.
Go through the below mentioned sections and perform maven build along with the author of this course.

Maven Crash Course.

- Introduction
- Maven Project Creation and Key Concepts
- Scopes
- Profiles

## Core Spring

Setter Based Injection

**Learn and Practice**

Go through the below mentioned sections and implement examples along with the author of this course.

Spring Framework in Easy Steps

- Introduction
- Software Setup
  - Troubleshooting Maven Projects
- Setter Injection
  - Create a Maven Project
  - Create the Java Bean
  - Create the Spring Configuration
  - Create and run the test
  - Value as attribute
  - Using p:schema or p: namespace

**Mandatory Hands-on (Platform: Tekstac)**

- DBConfig-SetterBasedInjection
- EZEE Transport

# Day 20

## Core Spring

Injecting collections, dependency check, Inner Beans and Scope.

**Learn and Practice**

Go through the below mentioned sections and implement examples along with the author of this course.
Spring Framework in Easy Steps

- Setter Injection
  - Injecting Collections

- List - Create the Spring Bean
- List - Create the Configuration file
- List - Create the Test
- Running the test and flow
- Two More Things About List

**Mandatory Hands-on (Platform: Tekstac)**

- CurrencyConverter-Collections (Refer section 4.34 and 4.35 of Udemy course to implement this hands on)

**Learn and Practice**

Spring Framework in Easy Steps

- Dependency Check , Inner beans and Scopes

**Mandatory Hands-on (Platform: Tekstac)**

- Customer-Address-Scope
- Customer-Address Inner Bean

## Day 21

Note: Behavioral skills will be covered in this week for 3 hours.

## Core Spring

Constructor based Injection, Spring Core Concepts, Autowiring, Usage of Properties.

**Learn and Practice**

Spring Framework in Easy Steps

- Constructor Injection
- Spring Core Concepts
- Using Properties

**Mandatory learning**

Spring Resource bundle with ResourceBundleMessageSource example

**Mandatory Hands-on (Platform: Tekstac)**

- Constructor Injection
- Engine Analysis

**Learn and Practice**

Spring Framework in Easy Steps
- Auto-Wiring

**Mandatory Hands-on (Platform: Tekstac)**

- Autowiring

## Core Spring

Stereotype Annotations, Injecting Interfaces

**Learn and Practice**

Spring Framework in Easy Steps
- Stereotype Annotations
- Injecting Interfaces

**Mandatory Hands-On**

- EBanking Hands on
- Passport Service

**Additional Hands-On**

- Patient Management

# Day 22

## Core Spring

**Continuous Learning: Technical Enablement**

Aspect Oriented Programming (AOP) using Spring AOP and AspectJ.

**Learn and Practice**

Spring Framework in Easy Steps
- Spring AOP
- Implement the examples along with the author.

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Spring AOP Demo

## Agile Basics

The key concepts and tools of Agile Development, Agile Project Delivery and Agile Project Management.

**Learn and Practice**

Agile Crash Course: Agile Project Management; Agile Delivery
- Go through entire course

# Day 23

## Core Spring

**Continuous Learning: Technical Enablement**

Spring JDBC

**Learn and Practice**

Spring Framework in Easy Steps
- Spring JDBC
- Implement the examples along with the author.

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Billing Software Application

**Additional Hands-on**

- EBill

**Assess-Type-1: Code Challenge (Platform: Tekstac)**

- All code challenges

## Stage 2: Milestone 2

**Overall Duration (including Behavioral Modules): 4 days**

### Day 24

### JUnit

Writing basic tests, Assert Statements

**Learn and Practice**
Go through the below mentioned sections and implement examples along with the author of this course.

[Learn Java Unit Testing with Junit & Mockito in 30 Steps]
- Introduction
- Unit Testing with Junit
  - JUnit Step 1 : Why is Unit Testing Important?
  - JUnit Step 2 : Setting up your first JUnit
    Step 03 : First Successful JUnit. Green Bar and assertEquals
  - Step 04 : Refactoring Your First Junit Test
  - Step 05 : Second JUnit Example assertTrue and assertFalse
  - Step 06 : @Before @After
  - Step 07 : @BeforeClass @AfterClass

**Mandatory Hands-on (Platform: Tekstac)**

- Electricity Bill
- Testing using Assertion.

**Additional Hands-on**
- Loan EMI Calculator

# Day 25

## JUnit

Testing Exceptions, Comparing Arrays, Parameterized Tests, Test Suites.

**Learn and Practice**
Go through the below mentioned sections and implement examples along with the author of this course.

Learn Java Unit Testing with Junit & Mockito in 30 Steps

- Unit Testing with Junit
  - Step 08 : Comparing Arrays in Junit Tests
  - Step 09 : Testing Exceptions in Junit Tests
  - Step 10 : Testing Performance in Junit Tests
  - Step 11 : Parameterized Tests
  - Step 12 : Organize JUnits into Suites

**Mandatory Hands-on (Platform: Tekstac)**

- Product Login Test Suite
- Parameterized

**Mockito**

**Learn and Practice**

Learn Java Unit Testing with Junit & Mockito in 30 Steps

- Getting Ready for Mockito
- Need For Mockito
- Mockito Basics

**Continuous Learning: Technical Hands-on**

**Mandatory Hands-on (Platform: Tekstac)**

- Verify Call - JUnit using Mockito
- TestMockDB

**Additional Hands-on**

- Test Callback

# Day 26

Note: Behavioral skills will be covered in this week for 3 hours.

## Test Driven Development

Test Automation, Test Code Optimization and Test Driven Development

**Learn and Practice**
Go through the below mentioned sections and implement examples along with the author of this course.

Learn TDD in 24 Hours

- Getting started with automated tests.
- Taking care of the test code
- Test-Driven Development

# Day 27

## Code Quality

The concepts include importance of code quality and coding standards.

**Master class**

To be driven by SME.

**Learn and Practice**

Refer this document.

**Mandatory Hands-on (Platform: Tekstac)**

- Hands On - LMS Refactoring

**Additional Learning**
Please go thru the links on **PMD, Checkstyle, FindBugs, SONAR** in the platform

**Assess-Type-1: Code Challenge (Platform: Tekstac)**

- All code challenges

# Stage 2: Milestone 3

**Overall Duration (including Behavioral Modules): 6 days**

## Day 28

### Servlets and JSP

Overview, Understanding Servlets, Web Application Request Flow.

**Learn and Practice**

Java In-Depth: Spring MVC For Beginners - Build Java Web App in 25 Steps.

- Part 1: Basic Java Web Application with JSP and Servlets.

.

**Additional Learning:**

- Please go thru the links on **Web and Application Servers, MVC frameworks** in the platform

### Spring MVC using Spring Boot

Spring initializer, https://start.spring.io,pom.xml, @SpringBootApplication, SpringApplication.run (), Controller, @RequestMapping, @ResponseBody

**Learn and Practice**

Go through the below mentioned sections and implement examples along with the author of this course.

Learn Spring Boot in 100 Steps - Beginner to Expert.

- Web Application with Spring Boot
  - Introduction
  - Skip Installation steps.
  - Step 0 : Web Application with Spring Boot - Section Introduction
  - Step 01: Part 1 Basic Spring Boot Web Application Setup
  - Step 01: Part 2 Pom.xml, Spring Boot Application and application properties
  - Step 02: Part 1 First Spring MVC Controller, @ResponseBody, @Controller
  - Fastest Approach to Solve All Your Exceptions
  - Step 02: Part 2 Understanding HTTP Request Flow

- Step 03: Demystifying some of the  Spring Boot magic

## Day 29

### Spring Boot Web Application

View Resolver, @RequestParam, ModelMap,Dispatcher Servlet, Spring MVC Web request flow, Web Application Architecture, Session scope, Request scope, @SessionAttributes.

**Learn and Practice**

Go through the below mentioned sections and implement examples along with the author of this course.

Learn Spring Boot in 100 Steps - Beginner to Expert.

- Web Application with Spring Boot
  - Step 04: Redirect to Login JSP -
  - @ResponseBody and View Resolver
  - Step 05: Show userid and password on welcome page - ModelMap and @R…
  - Step 06: DispatcherServlet and Spring MVC Flow
  - Step 07: Your First HTML form
  - Step 08: Add hard-coded validation of userid and password
  - Step 09: Magic of Spring
  - Step 10: Create TodoController and list-todos view. Make TodoService a @S…
  - Step 11: Architecture of Web Applications
  - Step 12: Session vs Model vs Request- @SessionAttributes
  - Step 13: Add new todo

**Mandatory Hands-on (Platform: Tekstac)**

- Zee Zee Login

## Day 30

### Spring MVC using Spring Boot

JSTL tags, Spring MVC form tag library, Validations, initBinder

**Learn and Practice**

Go through the below mentioned sections and implement examples along with the author of this course.

Learn Spring Boot in 100 Steps - Beginner to Expert.

- Web Application with Spring Boot
  - Step 14: Display Todos in a table
  - using JSTL Tags
  - Step 15: Bootstrap for Page Formatting using webjars
  - Step 16: Let's delete a Todo
  - Step 17: Format Add Todo Page and Adding Basic HTML5 form validation
  - Use modelAttribute instead of commandName
  - Step 18: Part 1 Validations with
  - Hibernate Validator - Using Command …
  - Step 18: Part 2 Using JSR 349 Validations
  - Step 19: Updating a todo
  - Step 20: Let's add a Target Date for Todo - Use initBinder to Handle Date Fields
- Step 25: Exception Handling

**Mandatory Hands-on (Platform: Tekstac)**

- HolidayParty-Validations
- BakingoCakeService
- Age Calculator

## Day 31

Note: Behavioral skills will be covered in this week for 3 hours.

Spring MVC Internationalization (i18n) - implement internationalization using the Spring MVC framework.

**Learn and Practice**

Refer this document and implement the example.

**Mandatory Hands-on (Platform: Tekstac)**

- Front End-Internationalization
- Body Mass Index

TruYum Practice case study

## Day 32

TruYum Practice case study

**Technical Quiz:**

- Quiz 1 - Spring MVC and Spring Boot

**Assess-Type-1: Code Challenge (Platform: Tekstac)**

- All code challenges

## Day 33

TruYum Practice case study

# Stage 2: ICT Prep up and ICT.

## Day 34

ICT Preparation

## Day 35

**Integrated Capability Test (ICT) (Platform: Tekstac)**

- ICT

# Stage 3 - Bootstrap

**Overall duration**: 2 days

This module deals with topics on responsive web design using **Bootstrap,** a styling framework. This can be done using Notepad++ or Visual studio

## Day 36

Note: Behavioral skills will be covered in this week for 3 hours.

Bootstrap – Introduction and basic component

**Learning reference:**

genc-web-ui-rwd-objectives

- Refer the objectives with session Id BTSP-T01 & BTSP-T02

**Hands-On:**

- Day 1 - Session 1
- Day 1 – Session 2

## Day 37

Bootstrap – Form elements and Cards

**Learning reference:**

genc-web-ui-rwd-objectives

- Refer the objectives with session Id BTSP-T03 & BTSP-T04

**Hands-On:**

- Day 2 - Session 1
- Day 2 – Session 2

# Stage 3: Spring Data JPA

**Overall duration**: 4 days

This module deals with topics on Spring Data JPA**.**

## Day 38

**Learning reference:**

genc-spring-data-jpa-objectives

- Refer the objectives with objective ORM-001 to ORM-006

**Hands-On:**

- Day 1 - Session 1 and 2

## Day 39

**Learning reference:**

genc-spring-data-jpa-objectives

- Refer the objectives with objective ORM-007 to ORM-0010

**Hands-On:**

- Day 2 – Session 1
- Day 2 – Session 2

## Day 40

**Practice Check:**

**Step 1:** Skeleton code (Standalone Core Java application) has been provided in the SharePoint link.
**Step 2:** Spring Core specification (truYum-spring-core-specification.docx) given should be implemented.
**Step 3:** Spring Data JPA specification (truYum-fse-spring-data-jpa-hibernate-specification.docx) should be implemented.

- TruYum Practice Case Study Artifacts

## Day 41

Note: Behavioral skills will be covered in this week for 3 hours.

**Final Check:**

**Step 1**: Skeleton code (Standalone Core Java application) has been provided in the SharePoint link.
**Step 2**: The movie list data for movie cruiser application now should be retrieved from spring configuration xml file and service layer should be introduced with autowiring of dao.

**Step 3:** Configure the persistence layer of the movie cruiser Spring application using Spring Data JPA.

- Movie cruiser Case Study

# Stage 3 –Lombok, Sonar

## Day 42 43 44

**Learning reference:**

genc-spring-rest-objectives

- Refer the objectives objective id SRW-006 to SRW-009

**Reference Links:**

http://www.javabyexamples.com/lombok-log4j-slf4j-and-other-log-annotations

https://projectlombok.org/

https://www.sonarqube.org/

https://dzone.com/articles/how-quickly-get-started-sonar

# Stage 3 – Design Principles

## Day 45 – Forenoon

SOLID principles, Need and benefits of Design patterns

**Learning reference:**

genc-DesignPrinciples-objectives

- Refer the objectives with session Id DP-T01

**Hands-On:**

- Day 1 - Session 1

## Day 45 – Afternoon

Design Patterns - Creational

**Learning reference:**

genc-DesignPrinciples-objectives

- Refer the objectives with session Id DP-T02

**Hands-On:**

- Day 1 - Session 2

## Day 46

**Note**: Behavioral training will be conducted for 3 Hrs. in the current week.

Creational and structural design patterns

**Learning reference:**

genc-DesignPrinciples-objectives

- Refer the objectives with session Id DP-T03 & DP-T04

### Hands-On:

- Day 2 - Session 1
- Day 2 - Session 2

## Day 47

Structural and Behavioral design patterns

### Learning reference:

genc-DesignPrinciples-objectives

- Refer the objectives with session Id DP-T05 & DP-T06

### Hands-On:

- Day 3 - Session 1
- Day 3 - Session 2

## Day 48

### Practice Check:

- Practice Check Case Study

## Day 49

### Final Check:

- Final Check Case Study

# Stage 3 – Data structures and Algorithm

Data structures and Algorithms would be done on Hacker rank platform (https://www.hackerrank.com/).

## Day 50

### Data Structure

Linear Data Structure- Array, Stack, Queue, Linked list, Matrix

**Learning reference:**

| | |
|---|---|
|  | Data Structures in Java - Part I (+INTERVIEW QUESTIONS)<br>• Refer section listed below in this Udemy course and follow the instructor for guided hands on.<br>○ Introduction<br>○ Arrays<br>○ Linked Lists<br>○ Stacks<br>○ Queues |

**Hands-On:**

- Hands On 1
- Hands On 2
- Hands On 3
- Hands On 4
- Hands On 5

## Day 51

**Note**: Behavioral training will be conducted for 3 Hrs. in the current week.

### Data Structure

Non-Linear Data Structure- Trees, Graphs

**Learning reference:**

| | |
|---|---|
| | Data Structures in Java - Part I (+INTERVIEW QUESTIONS)<br>• Refer section listed below in this Udemy course and follow the instructor for guided hands on.<br>○ Binary Search Trees |

Go through the following links for better understanding of the other data structures

- Graph Data Structure
- Heap Data Structure
- Hash Data Structure

## Day 52

**Hands-On:**

- Hand On 1
- Hand On 2
- Hand On 3
- Hand On 4
- Hand On 5

## Day 53

**Algorithm**

Algorithm- Searching, Sorting, Pattern Searching, Divide and Conquer

**Learning reference:**

| | |
|---|---|
| | Algorithms and Data Structures in Java - Part II<br>• Refer section listed below in this Udemy course and follow the instructor for guided hands on.<br>○ Substring Search<br>○ Strings<br>○ Basic Sorting Algorithm |

**Hands-On:**

- Hands On 1
- Hands On 2
- Hands On 3
- Hands On 4
- Hands On 5

Online references:

| |
|---|
| https://www.geeksforgeeks.org/data-structures/ |
| https://www.geeksforgeeks.org/fundamentals-of-algorithms/ |

### Additional Hands-on reference:

Hands-on Problem Statements: Reference 2

## Day 54 - Forenoon

**Practice Check:**

- Hackerrank assessment – Practice

## Day 54 – Afternoon

**Final Check:**

- Hackerrank assessment - Final

# Stage 4 – Spring Restful Webservices

## Day 55

**Learning reference:**

genc-spring-rest-objectives

- Refer the objectives with objective SPRING-CORE-T01 and SPRING-REST-T02

**Hands-On:**

- Day 1 - Session 1 and 2

## Day 56

**Learning reference:**

genc-spring-rest-objectives

- Refer the objectives with objective SPRING-REST-T03 and SPRING-REST-T04

**Hands-On:**

Day 2 - Session 3 and Session 4

**Learning reference:**

genc-spring-rest-objectives

- Refer the objectives objective id SRW-010 to SRW-011

## Day 57 and Day 58

**Practice Check:**

**Step 1:** Standalone Core Java application) will be provided to you.
**Step 2:** Spring Restful Webservices specification should be implemented.

- TruYum Practice Check Specification

## Day 59 and Day 60

**Final Check:**

**Step 1:** Standalone Core Java application) will be provided to you.
**Step 2:** Spring Restful Webservices specification should be implemented.

- Movie Cruiser Check Specification

# Stage 4 – MicroServices

## Day 61 to 63

**Learning reference:**

genc-microservices-objectives

- Refer the objectives with objective SPCLD-001 to SPCLD-005
- Refer the objectives with objective SPCLD-007 to SPCLD-012

**Hands-On:**

- Day 1 to 3
- Day 4 and Day 5

## Day 64

- TruYum Practice Check Specification

## Day 65

- Movie Cruiser Final Check Specification

# Stage 4 –Kubernetes

**Overall Duration: 2 days**

## Day 66

**Learning Reference:**

genc-AWS-Docker-DevOps-Objectives_FSE

- Refer the objective with the objective Id AWS 08

**Important**:

- Trainer needs to explain the complete architecture of the Kubernetes cluster and various components in the cluster.
- Trainer needs to demonstrate installing **Kubectl** and **Minikube** and setting up a local cluster

**Hands-On:**

Setting up local kubernetes cluster

## Day 67

**Learning Reference:**

genc-AWS-Docker-DevOps-Objectives_FSE

- Refer the objective with the objective Id AWS 08

**Hands-On:**

Deploying Simple Microservice in a Local K8S cluster

# Stage 4 – AWS, CI/CD

## Compute: Cloud Fundamentals, Network and Delivery, VPC, Security Groups, Gateway, NACL, Different Services Available in AWS

**Overall Duration: 8 days**

## Day 68

**Learning Reference:**
Genc-AWS-Objectives.

- Refer the Objectives with Objective Ids: AWS-001, AWS-002, ECC-001 to ECC-005, SSS-001 to SSS-003, AWSDB-001 to AWSDB-005, AWSNET-001

**Hands-On:**

- EC2-Hands-on
- S3-Hands-on

## Day 69

### Compute: Cloud Fundamentals, Network and Delivery, VPC, Security Groups, Gateway, NACL, Different Services Available in AWS

**Learning Reference:**
Genc-AWS-Objectives.

- Refer the Objectives with Objective Ids: AWS-001, AWS-002, ECC-001 to ECC-005, SSS-001 to SSS-003, AWSDB-001 to AWSDB-005, AWSNET-001

**Hands-On:**

RDS-Hands-on

AWS-lab-hands-on-practice.mp4

## Day 70

### Developer Tools: DevOps, AWS Code Commit, AWS CI/CD

**Learning Reference:**

Genc-AWS-Objectives

- Refer the Objectives with the Objective Ids: DevOps-001 and DevOps-002

**Hands-On:**

cicd-lab.mp4

## Day 71

### AWS RDS, ECS, ECR, ALB, Fargate Deployment, CI/CD

**Learning References:**

Genc-AWS-Objectives

- Refer the Objectives with the Objective Ids: AWSSRV-001 to AWSSRV-003

Hands-On

Spring-REST-with-RDS-Backend

**Note**: Trainer to demonstrate creating a simple “Hello World” Microservice, creating an image, pushing the image to the ECR, creating a container out the of image from ECR using the “Getting Started” wizard of ECS and deploy the application in ECS. Access the application from anywhere. Gencs to replicate the same demo done by the trainer.

## Day 72

### AWS RDS, ECS, ECR, ALB, Fargate Deployment, CI/CD

Genc-AWS-Objectives:

- Refer the Objectives with the Objective Ids: AWSSRV-004 and AWSSRV-005

**Hands-On:**

- Spring-Boot-Microservices-AWS-Fargate-ECS-CICD.mp4
- Swagger-Hands-on

## Day 73

### AWS RDS, ECS, ECR, ALB, Fargate Deployment, CI/CD

Genc-AWS-Objectives:

- Refer the Objectives with the Objective Ids: AWSSRV-006 and AWSSRV-007

**Hands-On:**

Note: Client application should be created using Spring MVC instead of Angular.

Spring MVC Client for Spring REST Service

## Day 74 and 75

### Integrate: AWS RDS, ECS, ECR, ALB, Fargate Deployment, CI/CD

Microservices with AWS and Spring Security

- Practice Check (Apply all the topics covered so far in Microservices and AWS with Spring Security)

## Stage 4 – My First POD Engagement

**Overall duration**: 10 days

Every GenC will undergo MFPE towards the end of their learning journey. This will help them to apply the skills acquired on a business case study while being in Agile POD team.
Mentors will guide them throughout in this two weeks engagement. They also evaluate their coding standards and problem solving skills during their mentorship.

## How to learn each day?

Each day has a set of learning objectives. These learning objectives can be met by going through the Udemy courses and by completing the hands on exercises mentioned in the daily plan.

The below strategies will help you decide the learning approach.

## Learning Strategy & Approach

Find below few imaginary profiles. For each of these profiles we have defined a recommended learning approach. This is not an exhaustive list. The approaches below might help invent a new way of learning.

## Profile #1

### Harry Reacher

**Engineering Discipline:** Electronics

**Skills:** Python, Ruby on Rails, nginx

**Project:** Mining Crime Data to get Route Cause Insights

**Learning Approach to Programming Languages:** I do not want to waste my time learning. I am more practice oriented. I want to work on the problem immediately

### What will work for me?

- Directly complete hands on exercises
- Refer Internet or Udemy Courses
- If hands on are implemented early, clarify your friends questions and troubleshoot their issues

## Profile #2

### Olivia Richards

**Engineering Discipline:** Computer Science

**Skills:** Java, C, C++

**Project:** Library Management System

**Learning Approach to Programming Languages:** I have interest, but I don't know where to start.

### What will work for me?

- Go through the recommended Udemy Course
- Try completing the hands on exercises
- Get your clarifications solved with help from Tech SME
- Get help from other learners in your batch whom had already completed

## Profile #3

### Greg Anderson

**Engineering Discipline:** Civil

**Skills:** C

**Project:** Fiber reinforced concrete

**Learning Approach to Programming Languages:** I am scared of programming languages. I haven't got my hands dirty with coding

### What will work for me?

- Go through the recommended Udemy Course
- Implement the coding along with the author of the Udemy Course
- Try completing the hands on exercises
- Clarify queries with SME
- Troubleshoot programming issues with help from SME or learner from your classroom whom had already completed

# FAQs

1. Who can participate in this program?
   Students who have enrolled for Full Internship can participate in this program.
2. Is there any pre-learning I should do?
   No. This program is open to all students from any academic discipline.
3. What is the significance of Hands-on in the overall learning journey?

   Hands-on focuses on specific topics in a Skill, which you can try and execute in the Platform. Group of such Hands-on exercises will be packaged together as a Code Challenge. This Code Challenge will allow you to benchmark your skills in the learning journey.

4. What is an Integrated Capability Test (ICT)?

   A case study problem statement will be provided to you, that you may need solve using the combination of Skills learnt in the given stage.

5. Whom do I reach out in case of any queries?

   Coach is your point of contact.
6. Is there Code Challenge and ICT for Stage 3?
   No, since it is not executed on Tekstak platform