Java FullStack Developer

December 18
2021

Course
Handbook

December, 2021

Dear All,

Warm greetings from the Team at **LearnJobs by The Coders Nation**.

Welcome to the Java FullStack Developer program. We are sure that this program, which has been designed with a great deal of thought and in alignment to TechMahindra requirements, will help you in achieving your career objectives.

The next few months of your learning is critical and your approach to learning will need to change. Not only will you need to attend the classroom sessions (online), you will also need to apply the concepts learnt in the hands-on classroom activities as well as perform project assignments in your context. This will help you to assimilate the classroom learning in a meaningful way.

The interactive sessions with experienced faculty and the frequency with which assignments and assessments are administered will ensure that learning does not stop with the classroom. The online support – where you will have access to the faculty/subject matter experts (SME's) outside the classroom will help you to overcome any challenges you may face while applying the concepts learnt in your project /assignment context.

It is not just the anticipation of working at a corporate MNC that is exciting, it is the journey towards it as well and hence it is important that you enjoy and participate actively in this program.

Wishing you all the very best in your journey

Team LearnJobs

1. Introduction

The Java Full Stack development program has been developed to ensure that the right skills and capabilities are developed for the candidates aspiring to work in Tech Mahindra and to support them in their career path so that they can be productive from the start of their employment.

The sessions in this learning program are aligned to the technical career path for candidates who are aspiring to be Java Full Stack developers at the entry level. The Learning program is spread over a period of 3 months for each batch and consists of classroom sessions with project assignments & formal assessments at the end of each module and final assessment and project delivery.

2. Why this program?

The objective of this program is to gain proficiency in Java Full Stack Development. This program is designed to address the career needs of candidates in the following competency areas namely

- Java Programming, Debugging and Unit Testing
- Java EE Web Application Fundamentals
- Java Persistence (JPA and Hibernate)
- Spring Core, Spring MVC, Spring Boot REST API
- Web Design & Development
- Front-end Development (Angular)
- Functional/BDD Testing using (Selenium)
- Git & Maven
- Agile and Devops

The program is mapped to the role expectations of Java Full Stack Test Lead minds in the Delivery & Technical career paths in TechMahindra and will address the competency requirements for the role in projects. This program can be taken up and completed over a period of 3 months giving the participants sufficient time to assimilate and apply the concepts learnt.

3. What is in it for me?

This program will enable me to

- Plan and execute current work in the best and most efficient way
- Learn in-depth Full Stack development via efficiently designed sessions, sufficient hand-on, close to real life case studies and projects and prepare overall for the long career through mock interviews.
- Learn through a program which has been designed systematically to play the Java Full Stack Developer role in TechMahindra.

4. What does a candidate need to do?

A candidate will need to enrol themselves online and clear the 2-step qualification test from Tech Mahindra.

The URL for the enrolment is: - https://learnjobs.org/techmahindra/fullstack

Once the candidate clears the qualification test and enrolls into the program after submitting all needed documents and the declaration form, Tech Mahindra will share a conditional offer – the candidate will get linked into one of the batches and a student account will be created in the LMS. The learning sessions will be facilitated through the LMS for the online sessions, for the offline sessions, candidates will get access to the course content used in the classroom in the LMS. Recording of the sessions will also be available to the candidates for the duration of the program. Assignments, Assessments and Exams will be facilitated through the LMS.

An automated mail will be sent to the student with the login details.

The URL for the LMS is: - https://tcn.seeklms.com

The module assignments and assessments will be open to the students for a predetermined time frame as indicated in the published schedule in the LMS. Once the due date is reached for submissions of assignments in the LMS / completion of assessments on the LMS – access will be revoked for those activities. In exceptional circumstances, access will be facilitated on approval by the faculty.

Once the candidate completes the course, passes the curriculum with the score and attendance threshold, the profile will be submitted to Tech Mahindra for final interviews. If the student passes the interview process then Tech Mahindra will extend an offer letter with a specific joining date in any of their locations based on their openings.

In a situation where the student does not pass the interview with Tech Mahindra, there will be one more opportunity given to the candidate. Prior to opting for this second and final opportunity, LearnJobs supports the candidate with additional months of training (maximum upto 3 additional months) to help build the needed skills to pass the final interview with Tech Mahindra.

5. Methodology

Online Classroom Sessions – Classroom sessions are designed to be interactive. Courseware and session recordings will be made available to the candidates in the LMS when the session is completed for future reference. Concepts will be discussed in the classroom and there will be discussions as well as ample hands on sessions. candidates need to actively participate to derive maximum benefits

Support – Essential aspects of learning includes timely clarification of doubts and discussing implementation-aspects with the faculty/SME's. Students are encouraged to make best use of the support available from the faculty/SME's.

Courseware – The courseware consists of the presentations used in the classroom, the recordings of the instructor-led sessions, the reference whitepapers as well as the reading references (books). The solutions to assignments will be discussed during the support activity.

Preparation - Sequence of the modules are in a later section in this booklet. You can prepare for the sessions by going through the table of contents and looking up the relevant topics suggested for this course. This will help you to participate actively in the sessions

In-training Assessments – Assessments (Exam) will be conducted periodically. In addition to these assessments, there will be practice tests/quiz for each module. The assessment schedule will be provided by the faculty. Candidates will also work on projects which will contribute to the assessment scores.

Performance Monitoring – Your performance will be monitored on a continuous basis. Your participation and performance in the assignments and assessments will count for the overall performance. Performance reports will be made available to TechMahindra periodically.

Faculty – Our faculty is one of the most important elements of this program. The faculty for this program has been practitioners for several years and are well versed in the practical aspects of delivery and implementation of concepts and best practices in engagements of all sizes.

6. Course Outline

COURSE TITLE	Java Full Stack Development
Course Code/Learning Path Code	LP-001
Total No of Sessions – Entire Program	No. of Courses: 11 No. of Sessions: 48
Course Type	Instructor Led Program

7. Course Description

The Java Full Stack Development course that comprises of multiple sessions for (Modules 1-10) leading to a final exam and project. Details of the Modules are as below.

Module 0 – General Introduction

General Introduction	
Kick-Off	Sponsor's goals and expectations from TechMahindra who has co-created the curriculum based on their needs
Roadmap for the program	How you, as a student will go through is program and what is expected of you.
Course Overview and Intent (Core Team)	> Overview and preparation activities > Installation of software & tools
LMS Overview	> Overview of the Learning Management System (LMS)

Module 1 – Agile Scrum and DevOps Fundamentals

Agile Scrum and DevOps Fundamentals	
Introduction to Agile Methodology	> Core Agile Concepts Overview > Traditional Project Management Methodologies > Drawbacks of Waterfall Methodologies > Agile Approach > Agile and Traditional Project Management
Scrum Fundamentals	> Scrum Methodology Elements and Terminology Overview > Project (Product; Release) Initiation > Scrum Planning & Execution > Iterations/Sprints Overview
Scrum Roles, Artifacts and Rituals	> Agile Teams and Team Space Overview > Scrum Master/Coach > Product Owner/Customer > Team Members/Developers
DevOps – Architecture	DevOps Architecture & Component Overview
DevOps – Lifecycle	DevOps Lifecycle Overview
DevOps- Workflow & Principles	Workflow & principles of DevOps
DevOps Tools Overview	> Overview of Docker > Overview of Jenkins > Overview of Kubernetes

Module 2 – Java Programming, Debugging and Unit Testing

Java Programming, Debugging and Unit Testing	
Java Architecture and Features	Describe the benefits of Java programming language Illustrate the Java architecture
Development Environment setup	Install and setup Java and Eclipse IDE
Language Fundamentals (Expressions, Statements) Control flow statements Arrays	Write Hello World Procedural language paradigms like Identifiers & Data Types Operators, Keywords, Expressions Statements, Control flow statements, arrays
Classes and Objects Methods Constructors	Local variable, Instance variable, Static variable Static, Non-static method Constructor, Access specifier Constructor overloading
Inheritance Overloading and Overriding Polymorphism	Inheritance relationship between classes Explain the use of "super" keyword Polymorphism-method overloading, overriding Implement dynamic binding
Design Patterns & Principles	Factory Pattern Singleton Pattern Inversion of Control & Dependency Injection
Packages	User Defined Package Access specifier role Access specifier role
Exception Handling	Exception framework Exception types User defined exception
Debugging	With Junit & Mockito
Concurrency in Java	Threads and its uses, Multithreading Create thread in java, Thread synchronization Thread lifecycle
Collection Framework	Introduction, types of collection interface Important methods of collection framework
Files and Stream	File class & Methods of file class Streams, Difference between streams and files Constructor and methods of Stream class Input and output Stream
Java 8 new Features	Lambda Expressions, Streams, DateTime APIs

Module 3 – Java EE Web Application Fundamentals

Java EE Web Application Fundamentals	
Introduction to Web	Environment setup, eclipse, tomcat Web Architecture JavaScript, Html, Servlets, MVC architecture
Introduction to J2EE	J2EE Basics
Servlets	Servlet API Fundamentals Servlet Context, Session, Cookies Request Redirection Techniques JDBC Introduction, architecture, JDBC in servlets
JSP	JSP Fundamentals Reading HTML form data with JSP State Management with JSP JSP Standard Tag Library – Core and Functional tags JDBC in JSP
Building MVC App with Servlets & JSP Complete App - Integrating JDBC with MVC App	

Module 4 – Java Persistence using JPA and Hibernate

Java Persistence using JPA and Hibernate	
Fundamentals of Java Persistence with Hibernate	Fundamentals of Java Persistence API Hibernate in action
JPA for Object/Relational Mapping, Querying, Caching, Performance and Concurrency	Object/Relational Mapping Querying Caching Performance and Concurrency (Query Tuning)
First & Second Level Caching, Batch Fetching, Optimistic Locking & Versioning	Cache Tier Batch Processing Bath Fetching and Processing strategy Optimistic Locking and Versioning
Entity Relationships, Inheritance Mapping & Polymorphic Queries	Replica of OOP fundamentals in ORM like Inheritance, Polymorphism etc.
Querying database using JPQL and Criteria API (JPA)	Introduction to JPQL Difference between Criteria Query and JPQL Criteria Query Introduction Restrictions, Projection Query Builder

Module 5 - Spring Core, Spring MVC, Spring Boot REST API

Spring Core, Spring MVC, Spring Boot REST API	
Spring Framework	Introduction , Spring basics Inversion of Control, Dependency Injection Bean Scope, Autowiring Spring Annotations
Spring MVC	Spring MVC basics, annotations Spring MVC restful web basics, annotations, without maven Spring MVC with Maven, Spring boot Spring MVC Application Deployment with Loggers Spring MVC WAR File Creation and Deployment Steps Spring MVC, Hibernate, Mysql, Apache Maven, Apache Tomcat- CRUD Operation Java, Spring MVC, Spring Security, Algorithm, Hibernate, Maven, Mysql Integration Application
Spring Security	Spring security basics, features, authentication, encryption Password encryption Creating Data base Web App with spring and hibernate(Spring Security Login Form) Spring security authentication, maven dependency Spring security CRUD, OAuth2, Spring Boot, end point security, restful web services with advanced authentication SSO with Spring Boot and Okta, OAuth2.0
Spring Data- JPA	Spring JPA Basics, Rest API, Spring Data JPA app1ication.properties file JPA repository, CRUD Repository Spring Boot, Spring Data JPA CRUD using Postman API Spring Boot, Spring Data JPA, Project Lombok CRUD using Postman API Hands on Session

Module 6 – Web Design & Development

Web Design & Development	
HTML5	HTML5 – Syntax, Attributes, Events, Web Forms 2.0, Web Storage, Canvas, Web Sockets
CSS3	CSS3 – Colors, Gradients, Text, Transform
Java Script	JavaScript – Core syntax, HTML DOM, objects, classes, Async
Ajax and jQuery	JQuery Selectors, JQuery Events, JQuery Callback JQuery Chaining, JQuery HTML AJAX Introduction, XMLHttpRequest Object XMLHttpRequest, Server Response AJAX load(), AJAX get() and post() Methods
Responsive web design	Introduction to responsive web design BootStrap for responsive web design

Module 7 – Front-end Development using Angular

Front-end Development using Angular	
Angular	Angular CLI Introduction to TypeScript Debugging Angular applications Components & Databinding in Depth Angular Directives Using Services & Dependency Injection Angular Routing, Observables Handling Forms in Angular Apps Output transformation using Pipes Making Http Requests Authentication & Route Protection Dynamic Components Angular Modules & Optimizing Angular Apps Deploying an Angular App Angular Animations Adding Offline Capabilities with Service Workers Unit Testing in Angular Apps (Jasmine, Karma)

Module 8 – Functional/BDD Testing using Selenium

Functional/BDD Testing using Selenium	
Selenium Fundamentals and IDE	Overview of Testing What is Test Automation Selenium Tool Overview
Selenium WebDriver	Introduction to Selenium WebDriver Evolution of Selenium WebDriver Advantages of Selenium WebDriver Selenium WebDriver Architecture Introduction to Web elements
Installation and Configuration	Selenium and Web Driver installation and configuration-handson
Locating WebElements	What are Web Elements Different type of Web Elements What is locator Type of locators Best Practices for Selenium locators
Driver Commands	Web Driver Commands
WebElement Commands	WebElement Commands

Module 9 – Version control using GIT

Version control using GIT	
GIT	git :: Overview, key concepts Step through the entire Git workflow Compare the different states in Git Compare between branches and commits Manage files with Git (move, rename, delete) Update files managed outside Git Create and fork repositories on GitHub Create branches and resolve merge conflicts

Module 10 – Apache Maven

Apache Maven	
Maven	Maven Fundamentals Software Setup - Command Line and Eclipse pom.xml and Directory Structure Multi-Module Project Creation Scopes Profiles

8. Assessments

Assessments of the participants in this program will be in multiple stages and will consist of both formative and summative assessments.

Formative assessments will be scheduled during each module and will be evaluated based on

- Hands On Assignments
- Projects

Summative assignments will be based on the exam scores and will be scheduled for a group of modules or individual modules

Weightage for each of these assessment items are as follows

Assessment Items	Weightage
Timely submission of activities & assignments	5%
Communication - Verbal and Written	5%
Project	20%
Assignments	20%
Timely completion of exams/quiz	5%
Exams/Quiz	30%

9. Procedure for taking Online Assessments and Assignments

The procedure for taking online assessments and submitting assignments are as follows.

- Logon to the LMS with the username and password provided to you (URL: <https://tcn..com >)
- Click on the **Assignments Due** Link on the right side of the browser screen
- You will see a list of assignments that are due with the dates.
- Click on the Assignment Title – Depending on the type of assignment, you will be taken to a page where you can upload your documents or take a quiz or an exam.
- Once done, click on the submit tab to submit.

10. Responsibilities of Students

Student responsibilities/discipline requirements are as follows

- Should be regular and punctual to sessions
- Switch off mobile phones and other electronic gadgets that are not required during sessions
- Participate in the discussions and case studies actively
- Complete assessment, assignments and exams on time
- Make the best use of support to assimilate learnings

11. Reference Books and useful websites

The faculty will suggest the reference books/reading material as applicable for individual modules in this course. You can use these references as supplementary reading material as we progress in this course.

The details of such references and reading material will be updated regularly in the LMS by the instructor

12. Frequently Asked Questions

General

1. **What does this Program cover?**
   Answer: This program covers the Java Full Stack curriculum. It has been customized based on the TechM requirements

2. **What is the duration of the Program?**
   Answer: The program is spread over 3 months. In the event you are not able to successfully clear the customer interviews in the stipulated time, the program can go up to 6 months (maximum 3 additional months of training with a monthly training fee)

3. **Classroom sessions are happening in location x, I am from location Y, can I attend the session online from location x?**
   Answer: No, all offline sessions you must attend in person ONLY.

4. **What is the time given to me to complete this program?**
   Answer: Each batch will get a program schedule ahead of time. We expect you to complete this certification program within that schedule. In the event you do not clear the customer interview in the first attempt, you will have an additional attempt after remedial measures.

5. **I have registered in batch X; can I continue my learning in batch Y?**
   Answer: At this point, once you join batch X, you must complete all sessions, exams sequentially. However, in exceptional/emergency cases, we might allow attending sessions in other batches. Approval for this would be on a case-to-case basis.

6. **I missed the learning session, how can I complete the program?**
   Answer: Once the sessions start, you can catch up with learning through the recorded sessions. You may discuss with your faculty regarding submission of assignments and assessments

7. **I want to refer to learning content, how can I get access to it?**
   Answer: All learning content is available for you in LMS. On the first day, you will get this handbook and details about this and the process to register/access LMS etc. will be provided to you.

8. **Can I take exams/assignments without attending instructor led sessions?**
   Answer: We do not recommend this, as there are activities and hands-on, which are very important for learning. Also, there is a weightage given to these activities in your overall grading/performance assessment. If you are unable to attend a particular session due to an emergency, you need to take the online recorded session and work out a timetable with your faculty to take assignments and exams

9. **What is the pass % required?**
   Answer: You must secure at least 75% . The cutoff will be set by TechMahindra

10. **What is the evaluation and grading methodology?**
    Answer: Evaluation is comprehensive and there will be marks allocated for hands-on activities, assignments, exams as well as timeliness. Details of the weightage are outlined in the section "Assessments". Rubrics will be used for all formative assignments assessments

Assignments & Assessments

1. **How many assignments I need to complete?**
   Answer: We will share a list of assignments with you. Note that all assignments are mandatory to submit.

2. **How do I submit assignments?**
   Answer: Assignments are to be submitted on the LMS. Please refer to the handbook where information and steps regarding this has been provided to you.

3. **How do I appear for assessments?**
   Answer: Assessments are to be submitted on the LMS. The procedure for assessments and assignments are exactly the same. Please refer to the handbook where information and steps regarding this has been provided to you.

Exams

1. **What are the prerequisites for taking the Exam?**
   Answer**:** To be able to take a Gate Exam, you have to have attended the classroom sessions and completed and submitted the relevant assignments as well as the assessments successfully.

2. **What would be the pattern of the Exam?**
   Answer: The final exam will consist of a set of MCQ's that could also be based on a case study. The level of difficulty of the questions will be 30% (easy), 40% (moderate) and 30% (difficult)

3. **When and how would the Exam be conducted?**
   Answer: The Exams will be conducted in a controlled environment through the learning platform. The duration of each of the exams is fixed and the submission of the exam will have to happen within the prescribed time limit. The system will give you warnings to submit when you are nearing your time limit. Please refer to the schedule for the dates and timings for the Gate Exam

4. **If I fail the exam what is the impact?**
   Answer: If you fail the exam, you can re-appear in the next scheduled exam. If you fail the 2nd time, you will need to go through remedial measures where your mentor will spend time with you and help you with learning areas that you have found challenging. However, you might not be able to attend customer interviews if exams are not completed on time; you will have to rejoin another batch.

5. **I failed the exam; can I continue my learning process?**
   Answer: Yes, you can continue the process after discussing with the faculty and TCN on remedial measures

6. **Can I reappear for the exams or assessment later on?**
   Answer**:** You are expected to complete your Exams and assessments in the slots provided to you. Each slot will be considered in the no. of attempts provided to you. If you fail the course, you can re-appear for the exam when it is next scheduled. Remedial action is recommended if you fail the exam second time in a row - you may not be able to continue with the course if you do not clear the exam in the <2> attempts that are provided to you. If you are not appearing for an exam on the scheduled day due to any reason, the corresponding exam slot will be considered as attempted even though it is a "No show".

7. **What happens if I don't clear the exam in 3 attempts?**
   Answer – You must write and get exceptional approval from both the faculty and LearnJobs for any future attempts. Please note that defaulting/no show for a scheduled exam will also be considered as an attempt.

8. **I did not come and attend exams – defaulted exams twice?**
   Answer – Both the scheduled exams will be counted as attempted. You will have just one and last chance to take exam i.e. 3rd attempt.You must write and get exceptional approval from both the faculty and LearnJobs for any future attempts

9. **Do I get any benefit from attending exams in sequential order? Timely completion of exams/quiz?**
   Answer: Yes, we are giving 5% marks for timely completion of exam, assignments and quiz

Internship & Customer Interviews

1. **I have successfully completed the training. When will I get the final job offer from TechMahindra?**
   Answer – On completion of the course and clearing the final exam/assessment as per the cutoff specified by TechM, we will schedule an interview with the customer. Your designated mentors will prepare you for this interview by conducting mock interviews. Once you clear the final interview, you would receive the final offer.

2. **What happens if I do not clear the customer interview the first time?**
    Answer: If you do not clear the customer interview in the first attempt, we will analyze the reasons and take remedial actions in terms of re-training in certain areas, mentoring etc. You will have a second interview with the customer.

3. **What happens if I do not clear the customer interview second time?**
    Answer: If you do not clear the customer interview in the second attempt also, the conditional offer given by the customer becomes invalid. However, TCN will attempt to place you with other customers.

4. **I am continuing with remedial training after initial training completion. When will I get the job offer ?**

    Answer: If you do not clear the customer interview in the second attempt also, the conditional offer given by the customer becomes invalid. However, TCN will attempt to place you with other customers.

Support & Feedback

1. **I need guidance on certain topics or in assignments, whom can I reach out to?**
Answer: You can ask your designated mentor to help you. In addition, we have planned support sessions for you by the faculty. Please check the published schedule for dates and time.

2. **I missed the planned session to clarify doubts; can I reach out to the trainer?**
Answer: Yes, you can discuss doubts and clarification over <meet/skype etc>. Your trainer will provide you with the timeslots and link for such discussions. You can also communicate to the trainers over email and support will be provided over email as well.

3. **How can I provide feedback on the course?**
Answer: You can provide feedback on each learning session through the LMS portal. Providing feedback for each session is mandatory as it will help attend to the gaps in any in a timely manner. You can escalate any issues to us at ***usha@thecodersnation.com***

4. **If I have issues accessing the Online Learning Management System, what should I do?**
Answer: If you cannot access the LMS URL, you will need to raise a support request. Please send a request to milan*@codersnation.com* with a summary of your problem in the subject line and details within the body of the mail. If your issue is not solved within 1 working day, escalate the issue to your batch coordinator.