

ADM Full Stack Engineering

Learning Guide - Java



**Why do we need this Full Stack Engineering Program?**

Full Stack Engineering 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!

Full Stack Prep-up

Learning Guide

Java Track



**Program at a glance**

Full Stack Prep-up Internship Program has 4 stages:

* Stage 1 - Core Programming Fundamentals for Full-Stack Web Development
* Stage 2 - Best Practices and Foundations of Backend Development
* Stage 3 - Backend Development and Microservices with Spring Boot and Spring Cloud
* Stage 4 - Frontend Development and Cloud Technologies
* Integrated Development Project (IDP)



**Program Highlights**

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* 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.
* Higher order framework concepts would be dealt with Trainer support in Instructor Led training mode.

**Program Highlights**

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**Know Your Service Line – ADM (Application Development and Maintenance)**

**Service Lines**

Service lines can simply be defined as a modern organizational structure strategy for resource planning and allocation for any size of business. Typically, traditional organizational structure models are more vertically aligned -- think of an employee who has several bosses in the hierarchical ladder before being directly under the company’s owner or president. Conversely, service lines follow a more horizontal continuum approach, where the company is strategically segmented into more manageable departments. The service line approach tends to focus more on the requirements of customers, which often results in noticeable increases in the customer satisfaction rate.

**What is Application Development?**

Application development goes through a process of planning, creating, testing, and deploying an information system, also known as the software development lifecycle. Applications are also often developed to automate some type of internal business process or processes, build a product to address common business challenges, or drive innovation.

**What is Application Maintenance?**

Application maintenance is the continuous updating, analyzing, modifying, and re-evaluating of your existing software applications. Application maintenance must be an ongoing task to ensure your applications are always running to the best of their abilities. Due to evolving customer expectations, the fight to survive in an existing market, and technological advancements, modifying and implementing new strategies is critical in maintaining sustainability and staying competitive. Every competitive business needs to constantly enhance and manage the IT solutions that have been developed in order to stay relevant and meet the wavering needs of users. This is where application maintenance and support come into the picture.

Contrary to popular belief, application maintenance is not just about fixing defects, but modifying a software product after delivery to correct faults, as well as to improve performance. Application maintenance and enhancement to existing applications begin with a thorough study of existing applications to identify areas of improvement.

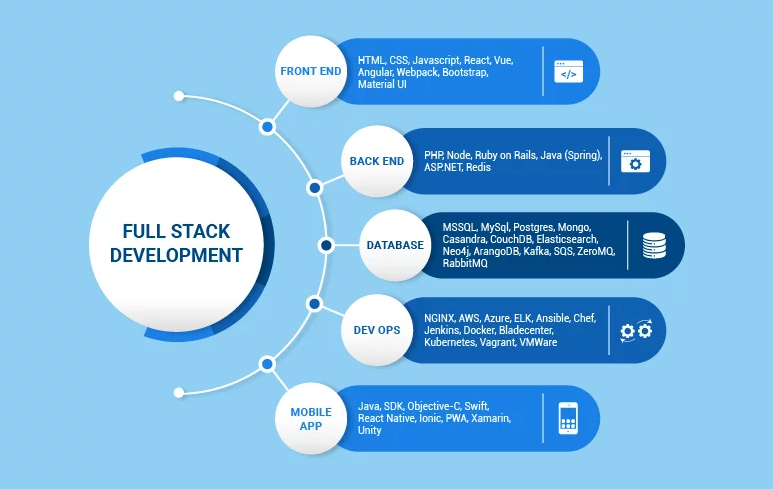
**Tips for Successfully Carrying Out Application Development and Maintenance**

Great user experience to end customers through the development and maintenance of modern apps is a must-have. Today, applications (web or mobile) are the most cost-effective and powerful ways to reach out to a vast market and generate revenues. With millions of applications being rolled out every day, it’s a good idea to keep in mind a few tips:

* Be as clear as possible as to what your requirements for your application are
* Thoroughly understand the services offered by application development companies and identify the right partner if you’re using a partner
* Evaluate the various development platforms and choose the one that best fits the needs of your business
* Make sure to embed processes that focus on continuous improvements and iterations to add new features and/or fix bugs
* When developing your application, make security your top priority
* Regularly update and test your application to deliver improved and better performance, high security, and a bug-free, seamless user experience

**What is Full Stack Development?**

Full Stack Development (FSD) is a software development process that includes both the front and back end. To that end, a Full Stack Developer may design and create the front end while simultaneously designing, developing, and debugging databases and the software’s backend. There are two significant components to full-stack application development. Development of the Front End and Back End.



**Roles and Responsibilities of a Full Stack Developer**

A full stack developer is responsible for both the front-end and back-end aspects of a web application. The specific roles and responsibilities can vary depending on the size of the development team and the complexity of the project, but some common responsibilities include:

1. Design and develop end-to-end web applications.
2. Implement front-end and back-end components using relevant technologies (e.g. HTML, CSS, JavaScript, React, Node.js, etc.).
3. Write clean, efficient, and well-documented code.
4. Debug and resolve technical issues.
5. Collaborate with the team and other stakeholders to deliver project on time.
6. Stay up-to-date with the latest technologies and industry trends.
7. Write automated tests to ensure code quality and improve application reliability.
8. Develop and maintain databases, servers and application deployment infrastructure.
9. Manage code repositories and version control systems (e.g., Git).
10. Participate in code reviews to ensure high-quality code.
11. Contribute to the architecture and design of applications.
12. Collaborate with designers, product managers, and other stakeholders to understand the requirements and build solutions that meet them.

**Learning Journey through 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 learning path is set in the [GEN C Learn Platform](https://cognizant.tekstac.com/login/index.php), which you can login with SSO.

**Flipped Classroom**

Flipped Classroom

Flipped Classroom

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Flipped Classroom

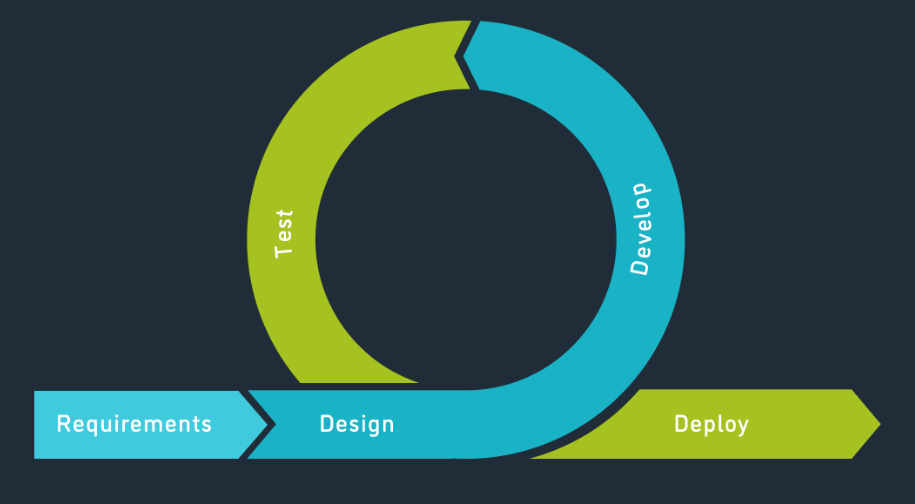
Flipped Classroom

**Integrated Development Project (IDP)**

**What is Integrated Development Project (IDP)?**

Integrated Development Project is an approach wherein the learner experiences the entire software development processes in an incremental fashion as part of the GenC Training. The IDP implementation is purely based on **Agile Software Development** methodologies and inspired from **PBL (Project-Based Learning)** which is learning while doing. It gives learners the opportunity to gain a deeper understanding of a topic through problem-solving using real-world examples and challenges.

Following is the Agile Development Methodology at high-level.

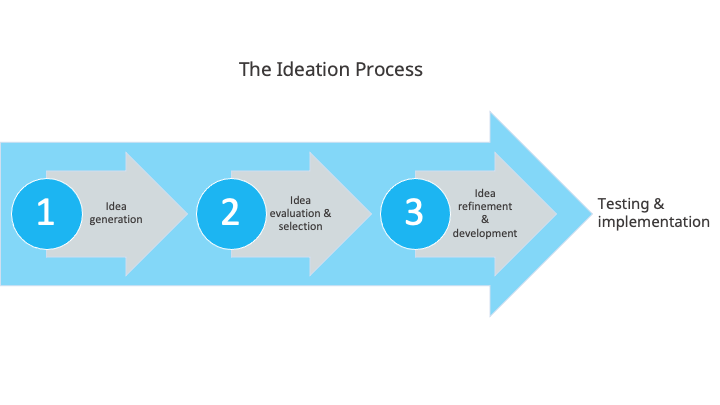


**Stages of IDP**

Following are the four seminal phases of IPD.

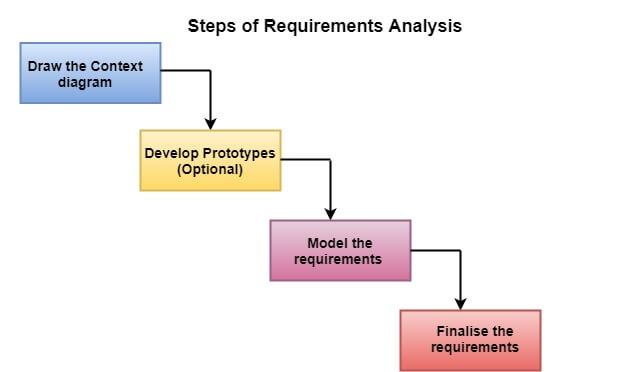
**Phase 1: Ideation**

Ideation is the creative process of generating, developing, and communicating ideas. It’s important to note that these ideas don’t have to be completely new. You can ideate to solve specific problems, look into new ways of implementing a solution, or even collect feedback and evaluate ideas.



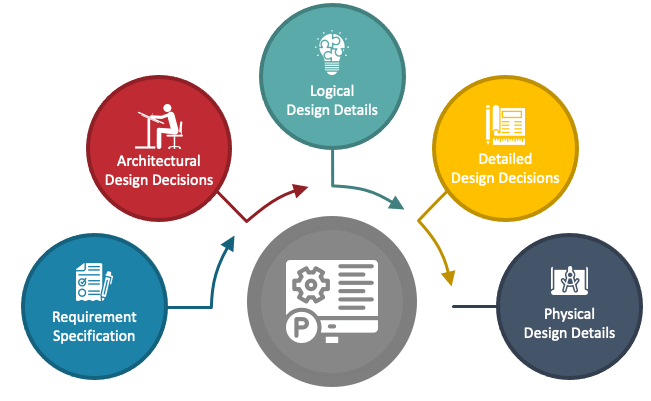
**Phase 2: Requirement Analysis**

Requirements analysis, also called requirements engineering, is the process of determining user expectations for a new or modified product. These features, called requirements, must be quantifiable, relevant and detailed. In software engineering, such requirements are often called functional specifications.



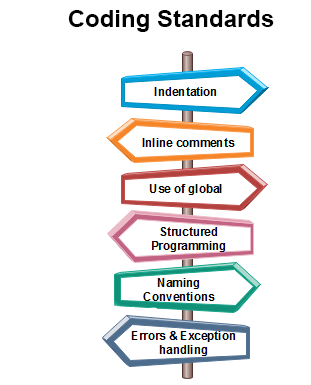
**Phase 3: Project Design**

Project design is a process to transform user requirements into some suitable form, which helps the programmer in software coding and implementation.



**Phase 4: Project Development**

Once the system design phase is over, the next phase is development. In this phase, developers start build the entire system by writing code using the chosen programming language. In this phase, tasks are divided into units or modules and assigned to the various developers. It is the longest phase of the Software Development Life Cycle process.



**Recommended Program Sequence**

The learning journey starts with **5 days of Icebreaker sessions, 1 day of Agile Workshop** followed by a technical learning that contains **4 stages** and they are the following:

* Stage 1 - Core Programming Fundamentals for Full-Stack Web Development
* Stage 2 - Best Practices and Foundations of Backend Development
* Stage 3 - Backend Development and Microservices with Spring Boot and Spring Cloud
* Stage 4 - Frontend Development and Cloud Technologies
* Integrated Development Project (IDP)

**Stage 1: Core Programming Fundamentals for Full-Stack Web Development**

**Stage 1 - Core Programming Fundamentals**

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**Stage 1 - Core Programming Fundamentals**

**Stage 1 - Core Programming Fundamentals**

**Stage 1 - Core Programming Fundamentals**

**Stage 1 - Core Programming Fundamentals**

**Stage 2: Best Practices and Foundations of Backend Development**

**Stage 2 - Deep Learnings**

**Stage 2 - Deep Learnings**

**Stage 2 - Deep Learnings**

**Stage 2 - Deep Learnings**

**Stage 2 - Deep Learnings**

**Stage 2 - Deep Learnings**

**Stage 2 - Deep Learnings**

**Stage 3: Backend Development and Microservices with Spring Boot and Spring Cloud**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 4: Frontend Development and Cloud Technologies**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

**Stage 3 – FSE Module**

All the 4 stages would be executed in the **Flipped classroom model** through Learning paths configured on the **Tekstac** platform.

There will be an integrated project called **IDP** (Integrated Development Project) which will be executed in an incremental fashion and is part of all the 4 stages.

**Key Learning and Evaluation Components of the Program**

**Self-Learning via Udemy**

Cognizant has collaborated with **Udemy** to provide world class learning videos for the evolving future of work. These Udemy programs are woven into a learning path, empowering you to plan and learn at your style.

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

The program doesn’t ONLY concentrate on the technical skilling, but also on the shaping up of the behavioral skills. **32 hours of Behavioral learning** would be done in ILT mode, with few Self-paced learning modules too.

GenCs will undergo evaluation at the end of Stage 1 of their learning in the form of a skill-based qualifier assessment. At the conclusion of Stage 3, there will be an interim evaluation during which learners will be assessed based on the technical skills covered up to that point and their progress in project deliverables. Towards the end of Stage 4, a final evaluation will take place, which will cover the entire scope of the training.

**Program Completion Criteria**

**RAG as PHS (Performance Health Status)**

The program continuously evaluates if you are able to apply those self-learnt skills to solve a real-time business problem. Depicted below are the two key learning components, which are distributed across the learning journey for the purpose of continuous evaluation.

**Interim Evaluation:**

During the interim evaluation, the GenC will undergo a video interview on the learning platform. This interview will be conducted by a Tech SME from the BU. The purpose of this evaluation is to assess the GenC's knowledge and understanding of the skills covered in the training program up to the halfway point. It also encompasses an evaluation of the GenC's progress in their Integrated Development Project (IDP). The evaluation will involve a technical discussion as well as an assessment of the IDP progression to gauge the GenC's proficiency in the skills learned thus far.

**Final Evaluation:**

For the final evaluation, the GenC will participate in a video interview conducted by a Tech SME from the BU. This evaluation aims to assess the GenC's knowledge and expertise in all the skills covered throughout the entire training program. Similar to the interim evaluation, this assessment will involve a technical discussion via a video interview on the learning platform, along with a project evaluation to assess the GenC's capabilities and their IDP's progress. It serves as a comprehensive evaluation of the GenC's skills and capabilities acquired during the training.

The above evaluation components will attribute to the **Performance Health Status** **(PHS)** of a GenC. Additional Learning Components like Hands-On, Quizzes, CCs, and ICTs will help you to enhance your expertise level.

**Mandatory Hands-On Exercise Completion**

* Completion of 100% of the hands-on exercises is mandatory to qualify for the stage 1 qualifier, interim, and final evaluations.

**Icebreaker Sessions**

Icebreaker

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| Icebreaker session will be conducted for a duration of initial **5 days**. During the session, various topics related to Corporate Induction, Talent Management, Cognizant Agenda on Core Values, Leader Talks, Alumni, BU Mentor connects will be covered. Followed by icebreaker, technical training will kick start.  **Following sessions will be covered during the 5 days of icebreaker**   * Corporate Induction * Talent Manager Connect * Cognizant Agenda Sessions on Core Values * Leader Talks (Academy) and many more… | 5 Icebreaker Activities for a Creative Meeting Introduction - Beekast blog |

**Learning Recommendation**

A recommended day-wise schedule is provided below for the learning, with the learning content for the day, the practice hands-on and extended hands-on to be done for the day or any other activities are listed.

**Stage 1 - Foundational Technology Skills**

**Stage 1** deals with foundational technology skills that help GenCs to get start with their software engineering career. We provide unique learning experience to learners by including diversified learning content and learning methodologies that are based on adult learning principles. At the end of this stage, there will be a **Qualifier Assessment** which determines the direction of the learning journey of a GenC at Cognizant.

As part of Stage 1 of your training, the following skills will be covered.

* Agile Methodology
* HTML5, CSS3 and JavaScript
* Bootstrap, jQuery
* ANSI SQL using MYSQL
* Core Java

**How and From Where to Learn?**

* Udemy learnings are recommended in the Platform to understand the fundamental concepts. In addition to this, you can also learn from any other sources as they are mentioned in this handbook.

**Integrated Development Project (IDP) Roadmap**

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| **Phases** | **Duration** | **Activities** | **Deliverables** |
| Phase1: Ideation/Brainstorm | 6 Days | 1. Project Ideation by GenC 2. Conducting various brainstorming sessions and generate project ideas 3. Finalize the project idea | 1. Project abstract and a title |

**Stage 1: Milestone 1 - Agile Methodology**

**Overview**

In **Milestone 1 of Stage 1**, learners will be introduced to the basics of **Agile methodology**. Agile is an approach to project management and software development that emphasizes flexibility, collaboration, and customer satisfaction. It involves adaptive planning, iterative development, early delivery, and continuous improvement. Agile methodologies, like Scrum and Kanban, focus on delivering value to the customer and responding to change effectively.

**Learning Objectives**

After completing this module, GenCs will be able to:

* Understand the principles and values of Agile methodology.
* Describe the benefits of using Agile in software development.
* Explain the differences between Agile and traditional project management approaches.
* Identify the key roles and responsibilities in Agile teams.
* Describe the iterative and incremental nature of Agile development.
* Explain the importance of customer collaboration and feedback in Agile.
* Describe common Agile practices, such as user stories, sprints, and retrospectives.
* Identify common Agile frameworks, such as Scrum, Kanban, and Extreme Programming (XP).
* Explain how Agile principles can be applied in different project environments.

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| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * Agile Methodology | * 8 hrs. | * N/A. |

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| **Day 1** |

**Agile Methodology**

**Key Topics:** Agile Basics

**Learn and Practice**

Learn about Agile process from the below Udemy course.

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| 4FCA95A2 | [Agile Crash Course: Agile Project Management; Agile Delivery](https://cognizant.udemy.com/course/agile-crash-course/learn/lecture/5315576#overview)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **All** Sections * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Stage 1: Milestone 2 - UI & Scripting Technologies**

**Overview**

**Milestone 2 of Stage 1** focuses on **Web UI technologies, including HTML5, CSS3, JavaScript, Bootstrap4, and jQuery**. These technologies are fundamental to building modern, responsive, and interactive user interfaces for web applications. HTML5 provides the structure for web pages, CSS3 allows for styling and layout customization, and JavaScript adds interactivity and dynamic behavior to the pages. Bootstrap4 is a popular CSS framework that simplifies the process of creating responsive designs, while jQuery is a JavaScript library that simplifies HTML document traversal and manipulation, event handling, and animation. Mastering these technologies is essential for developing engaging and user-friendly web applications.

**Learning Objectives**

After completing this module, GenCs will be able to:

* Define HTML and common terminology related to HTML, recognize correct HTML syntax, and write a brief error-free HTML code.
* Apply style to an existing/new web page as per the requirement using CSS3.
* Write and employ JavaScript code to solve practical web design problems.
* Make responsive, cross-platform and modern websites using Bootstrap4.
* Illustrate animated, interactive web pages using jQuery libraries.

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| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * HTML5, CSS3 and JavaScript | * 12 hrs. | * 8 hrs. |
| * Bootstrap4 | * 8 hrs. | * 8 hrs. |
| * jQuery | * 4 hrs. | - |

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| **Day 2** |

**HTML5, CSS3**

**Key Topics:** HTML5 - Introduction, Getting Started, Elements & Attributes, Navigation, Events, Web Forms 2.0, Web Storage, Web SQL Database, Geo location; CSS3- Introduction, Selectors, Styling, Box Model, Advanced

**Learn and Practice**

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| C:\Users\125546\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\7FDA4829.tmp | [Responsive Web Design: HTML5 + CSS3 for Entrepreneurs 2018](https://cognizant.udemy.com/course/html-css-more)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * Lets Learn Some HTML 5 * CSS3 & First Project * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-on**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Technical Quiz**

Attempt the following technical quiz in the Learning Path at Tekstac to check your knowledge level on HTML5 and CSS3.

* Quiz 1 - HTML 5 & CSS3

**Code Challenge (For Practice Only)**

Take on the following Code Challenge in the Tekstac Learning Path to assess your skill level in HTML5 and CSS3. You will have 3 attempts, and you must score 70% or higher to pass this challenge.

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|  | Do not copy paste the code. Write the code yourself. |

* Code Challenge - HTML5 and CSS3

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| **Day 3** |

**JavaScript**

**Key Topics:** JavaScript Fundamentals

**Learn and Practice**

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| 4FCA95A2 | [Javascript basics for beginners](https://cognizant.udemy.com/course/javascript-basics-for-beginners/) |
|  | * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 1:** Getting Started   + **Section 2:** Basics   + **Section 3:** Operators   + **Section 4:** Control flow * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Technical Quiz**

Attempt the following technical quiz in the Learning Path at Tekstac to check your knowledge level in JavaScript.

* Quiz 2 - JavaScript

**Additional Learning**

Go through the Udemy course to understand the usage of Chrome Developer Tools, a comprehensive toolkit for developers built directly into the Chrome browser. These tools allow you to edit web pages in real-time, diagnose problems more quickly, and build better websites faster.

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| 4FCA95A2 | [Devtools Pro: The Basics of Chrome Developer Tools](https://cognizant.udemy.com/course/devtools-2017-the-basics-of-chrome-developer-tools/) |
|  | * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **All** Sections * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

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| **Day 4** |

**JavaScript**

**Key Topics:** JavaScript Deep Dive

**Learn and Practice**

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| 4FCA95A2 | [Javascript basics for beginners](https://cognizant.udemy.com/course/javascript-basics-for-beginners/)   * Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below. * **Section 5:** Objects * **Section 6:** Arrays * **Section 7:** Functions * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-on**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Code Challenge (For Practice Only)**

Attempt the following Code Challenges through the Learning Path at Tekstac for checking your skill level on JavaScript. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

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|  | Do not copy paste the code. Write the code yourself. |

* Code Challenge - JavaScript

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| **Day 5** |

**Bootstrap4**

**Key Topics:** Bootstrap Fundamentals, Grid System, NAV Bar

**Learn and Practice**

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| 4FCA95A2 | [The Bootstrap 4 Bootcamp](https://cognizant.udemy.com/course/bootstrap-4-bootcamp/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 3:** Getting Started With Bootstrap 4   + **Section 4:** Bootstrap 4 Basics   + **Section 5:** Super Useful Utilities   + **Section 7:** Navbars and Flexbox! * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 6** |

**Bootstrap**

**Key Topics:** Bootstrap Components

**Learn and Practice**

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| 4FCA95A2 | [The Bootstrap 4 Bootcamp](https://cognizant.udemy.com/course/bootstrap-4-bootcamp/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 8:** The Magical Grid System   + **Section 9:** Cards and List Groups   + **Section 10:** Other Components   + **Section 11:** JavaScript Components * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 7 - Forenoon** |

**Bootstrap4**

**Key Topics:** Bootstrap Styles

**Learn and Practice**

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| 4FCA95A2 | [The Bootstrap 4 Bootcamp](https://cognizant.udemy.com/course/bootstrap-4-bootcamp/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 12:** Customizing Bootstrap w/ SASS * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 7 - Afternoon** |

**jQuery**

**Key Topics:** Introduction to jQuery and its Features, Basic Components of jQuery, DOM Manipulation and Events in jQuery

**Learn and Practice**

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| 4FCA95A2 | [The Complete jQuery Course: From Beginner To Advanced!](https://cognizant.udemy.com/course/jquery-tutorial/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 1:** Introduction   + **Section 3:** Element Selectors   + **Section 4:** Manipulating the DOM I – Inserting, Replacing and Removing Elements   + **Section 5:** Manipulating the DOM II – Changing   Element Data and CSS   * + **Section 6:** Events I ‒ Handling Mouse Events & Keyboard Events   + **Section 7:** Events II ‒ Forms * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Stage 1: Milestone 2 - SQL**

**Overview**

In **Milestone 2 of Stage 1**, the focus will be on **ANSI SQL using MySQL**. ANSI SQL (American National Standards Institute Structured Query Language) is a standardized version of SQL that ensures compatibility across different database systems. MySQL is a popular open-source relational database management system that uses SQL for database access. This milestone will cover key concepts of ANSI SQL, such as querying databases, modifying data, creating and managing database objects, and implementing data integrity. By using MySQL as the implementation platform, GenCs will gain practical experience in applying ANSI SQL concepts to a real-world database system, preparing them for database development tasks in various IT roles.

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**Learning Objectives**

After completing this module, GenCs will be able to:

* Learn ANSI SQL fundamentals and their application in MySQL.
* Practice retrieving and manipulating data using the SELECT statement in MySQL.
* Apply filtering, sorting, and grouping techniques to query data effectively.
* Gain an understanding of join operations and subqueries for combining data from multiple tables.
* Develop skills in modifying data with INSERT, UPDATE, and DELETE statements in MySQL.

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| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * ANSI SQL Using MySQL | * 8 hrs. | * 8 hrs. |

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| **Day 8** |

**ANSI SQL Using MySQL**

**Key Topics:** Introduction to ANSI SQL and MySQL, Data Retrieval with SELECT Statement, Filtering and Sorting Data, Aggregate Functions and Grouping

**Learn and Practice**

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| --- | --- |
| 4FCA95A2 | [SQL for Beginners: Learn SQL using MySQL and Database Design](https://cognizant.udemy.com/course/sql-for-beginners-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 2:** Installation and Setup   + **Section 6:** Selecting from a Table   + **Section 10:** Aggregate Functions * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the solution. Write the query yourself. |

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**Technical Quiz**

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on Database design.

* Quiz 1 - Database concepts

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| **Day 9** |

**ANSI SQL Using MySQL**

**Key Topics:** Joins and Subqueries, Data Modification with INSERT, UPDATE, DELETE, Creating and Modifying Tables, Indexes and Constraints

**Learn and Practice**

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| 4FCA95A2 | [SQL for Beginners: Learn SQL using MySQL and Database Design](https://cognizant.udemy.com/course/sql-for-beginners-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 7:** Selecting From Multiple Tables   + **Section 8:** Database Design   + **Section 11:** Subqueries   + **Section 3:** Data Definition Language   + **Section 4:** More On Alter Table   + **Section 5:** Data Manipulation Language * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the solution. Write the query yourself. |

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**Technical Quiz**

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on ANSI SQL.

* Quiz 2 - ANSI SQL

**Code Challenge (For Practice Only)**

Attempt the following Code Challenges through the Learning Path at Tekstac for checking your skill level on ANSI SQL. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

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|  | Do not copy paste the solution. Write the query yourself. |

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**Stage 1: Milestone 3 - Application Programming**

**Overview**

**Milestone 3 of Stage 1** will focus on **application programming using core Java**. This milestone will cover essential concepts and features of Java programming, including object-oriented programming principles, data types, control flow statements, and methods. GenCs will learn how to create and manipulate objects, work with arrays and collections, handle exceptions, and use Java libraries. The milestone will also introduce key concepts such as inheritance, polymorphism, encapsulation, and abstraction. Through hands-on exercises and projects, GenCs will apply their knowledge to develop Java applications, gaining practical experience in software development using core Java.

**Learning Objectives**

After completing this milestone, GenCs will be able to

* Understand control flow statements such as if-else, switch-case, for, while, and do-while loops for decision making and repetition in Java programs.
* Learn about arrays in Java, including their declaration, initialization, and manipulation for storing multiple values of the same type.
* Understand the concept of methods in Java, including method declaration, parameters, return types, and method overloading.
* Gain a solid understanding of object-oriented programming (OOP) concepts such as encapsulation, inheritance, and polymorphism.
* Learn about exception handling in Java, including the use of try-catch blocks, throw, and throws keywords for handling runtime errors.
* Explore file input/output (I/O) operations in Java, including reading from and writing to files using streams.
* Understand the Java Collections Framework, including core interfaces like List, Set, and Map, along with their implementations for storing and manipulating collections of objects.
* Learn about multithreading in Java, including creating and managing threads, synchronization, and thread communication.
* Gain familiarity with Java API classes and packages for common tasks like networking, I/O, and utilities, along with database connectivity using JDBC.
* Learn about the features introduced in Java 11 and Java 12, including new APIs and enhancements.
* Learn about the new features and enhancements introduced in Java 17, such as pattern matching for switch, sealed classes, and enhanced APIs.

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| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * Core Java | * 40 hrs. | * 44 hrs. |

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| **Day 10** |

**Core Java**

**Key Topics:** Introduction to Java, Variables and Data Types, Operators

**Learn and Practice**

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| 4FCA95A2 | [Java 17 Masterclass: Start Coding in 2024](https://cognizant.udemy.com/course/java-the-complete-java-developer-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 3:** First Steps * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Technical Quiz**

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on Java fundamental concept.

* Quiz 1 - Java Operator, Control flow statement

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| **Day 11** |

**Core Java**

**Key Topics:** Control Flow Statements

**Learn and Practice**

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| 4FCA95A2 | [Java 17 Masterclass: Start Coding in 2024](https://cognizant.udemy.com/course/java-the-complete-java-developer-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 6:** Control Flow * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 12** |

**Core Java**

**Key Topics:** Arrays, Methods.

**Learn and Practice**

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| 4FCA95A2 | [Java 17 Masterclass: Start Coding in 2024](https://cognizant.udemy.com/course/java-the-complete-java-developer-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 9:** Arrays   + **Section 5:** Expressions, Statements & More * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 13** |

**Core Java**

**Key Topics:** Object Oriented Programming Concepts

**Learn and Practice**

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| 4FCA95A2 | [Java 17 Masterclass: Start Coding in 2024](https://cognizant.udemy.com/course/java-the-complete-java-developer-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 7:** OOP Part 1 - Inheritance * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Technical Quiz**

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on Object oriented programming concept.

* Quiz 2 - Applying Object Oriented Concepts in java

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| **Day 14** |

**Core Java**

**Key Topics:** Object Oriented Programming Concepts

**Learn and Practice**

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| 4FCA95A2 | [Java 17 Masterclass: Start Coding in 2024](https://cognizant.udemy.com/course/java-the-complete-java-developer-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 8:** OOP Part 2 – Polymorphism   + **Section 13:** Nested Classes and Types * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 15** |

**Core Java**

**Key Topics:** Object Oriented Programming Concepts

**Learn and Practice**

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| 4FCA95A2 | [Java 17 Masterclass: Start Coding in 2024](https://cognizant.udemy.com/course/java-the-complete-java-developer-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 11:** Abstraction in Java * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 16** |

**Core Java**

**Key Topics:** Exception Handling, File I/O

**Learn and Practice**

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| 4FCA95A2 | [Learn JAVA Programming - Beginner to Master](https://cognizant.udemy.com/course/java-se-programming)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 18:** Exception Handling   + **Section 23:** Java IO Streams * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 17** |

**Core Java**

**Key Topics:** Collection Framework

**Learn and Practice**

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| 4FCA95A2 | [Learn JAVA Programming - Beginner to Master](https://cognizant.udemy.com/course/java-se-programming)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 25:** Collection Framework * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Technical Quiz**

Attempt the following technical quiz in the Learning Path at Tekstac for checking your knowledge level on Collections framework in Java.

* Quiz 3- Collections Framework

**Code Challenge (For Practice Only)**

Attempt the following Code Challenges through the Learning Path at Tekstac for checking your skill level on Java basics. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

* Code Challenge - Group 1

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| **Day 18** |

**Core Java**

**Key Topics:** Multithreading

**Learn and Practice**

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| 4FCA95A2 | [Learn JAVA Programming - Beginner to Master](https://cognizant.udemy.com/course/java-se-programming)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 19:** Multithreading * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 19** |

**Core Java**

**Key Topics:** Java API

**Learn and Practice**

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| 4FCA95A2 | [Learn JAVA Programming - Beginner to Master](https://cognizant.udemy.com/course/java-se-programming)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 20:** Java.lang.Package   + **Section 26:** Date and Time API * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 20** |

**Core Java**

**Key Topics:** Database Connectivity (JDBC)

**Learn and Practice**

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| 4FCA95A2 | [Java 17 Masterclass: Start Coding in 2024](https://cognizant.udemy.com/course/java-the-complete-java-developer-course)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 22:** Working with Databases * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 21** |

**Core Java**

**Key Topics:** Java 8, 11 & 12 Features

**Learn and Practice**

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| 4FCA95A2 | [Core Java Made Easy (Covers the latest Java 18)](https://cognizant.udemy.com/course/corejavamadeeasy)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 29:** Java 8 Features   + **Section 40:** Java 11 Features   + **Section 41:** Java 12 Features * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 22** |

**Core Java**

**Key Topics:** What's New in Java 17?

**Learn and Practice**

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| 4FCA95A2 | [Core Java Made Easy (Covers the latest Java 18)](https://cognizant.udemy.com/course/corejavamadeeasy)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 46:** Java 17 * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

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**Code Challenge (For Practice Only)**

Attempt the following Code Challenges through the Learning Path at Tekstac for checking your skill level on Java and JDBC. There will be only 3 attempts and you have to secure 70% in order to clear this challenge.

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|  | Do not copy paste the code. Write the code yourself. |

* Code Challenge - Group 2

**ICT (Integrated Capability Test) (For Practice Only)**

Take up the following extended integrated practice task in order to check your skill level after completing the Stage 2 of your training. Unlike Code Challenge, the coverage of this practice will be MySQL, Java and JDBC. There will be only 3 attempts and you have to score a minimum 70% in order to complete this activity successfully.

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|  | Do not copy paste the code. Write the code yourself. |

* Stage 1 ICT

**Mock Stage 1 Assessment**

* Ensure that you take the mock stage 1 assessment before the actual one to become familiar with its pattern. You can attend the mock qualifier multiple times.

**Stage 1 Assessment**

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| **Day 23, 24** |

**Stage 1 Assessment**

* These two days will be spent on the Qualifier assessment and result publishing.

**IDP - Project Abstract Review**

* One of these days can also be utilized for IDP - Project Abstract review with the tech SME.

**Stage 2: Best Practices and Foundations of Backend Development**

**Overview**

**Stage 2** of the training focuses on advanced skills essential for software development. It covers Design Patterns and Principles, providing GenCs with a solid understanding of best practices for designing reusable and maintainable software solutions. The module on Data Structures and Algorithms equips GenCs with the knowledge needed to efficiently manipulate and store data, crucial for developing efficient algorithms. Spring Core and Maven are introduced to teach GenCs about dependency injection, aspect-oriented programming, and project management with Maven. The module on TDD using JUnit and Mockito emphasizes the importance of test-driven development in ensuring code quality and reliability. GenCs also learn about SLF4J and Lombok for logging and reducing boilerplate code. Lastly, the module on Code Quality Standards and SonarQube teaches GenCs how to maintain high-quality code by following industry standards and using tools like SonarQube for code analysis and quality assurance.

As part of **Stage 2** of your training, the following skills will be covered.

* Design Patterns and Principles
* Data Structures and Algorithms
* Spring Core and Maven
* TDD using JUnit and Mockito
* SLF4J and Lombok
* Code Quality Standards, SonarQube

**How and From Where to Learn?**

* You can learn from the sources as they are mentioned in this learning guide.

**Integrated Development Project (IDP) Roadmap**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phases** | **Duration** | **Activities** | **Deliverables** |
| * Design | * 8 hrs. | * Demo & Re-work (if any) | * N/A |

**Stage 2: Milestone 1 - Java Best Practices**

**Overview**

**Milestone 1 of Stage 2** focuses on Design Patterns and Principles using Java. This milestone is crucial as it delves into the fundamental concepts that guide the design and implementation of robust, maintainable, and scalable software solutions. Understanding design patterns allows GenCs to leverage proven solutions to common problems, enhancing the quality and efficiency of their code. Additionally, mastering design principles enables GenCs to create well-structured and adaptable software architectures. Through this milestone, GenCs will gain a solid foundation in applying these concepts, empowering them to develop high-quality Java applications.

**Learning Objectives**

After completing this milestone, GenCs will be able to

* Explain the importance of SOLID principles in software design.
* Define the Single Responsibility Principle and explain why it is important in software design.
* Apply the Open/Closed Principle to extend the behavior of a class without modifying its source code.
* Describe the purpose and structure of the Observer pattern and provide an example of its application in a software system.
* Analyze a problem scenario and select an appropriate design pattern to address the given requirements.
* Write a unit test for a class that uses the Factory Method pattern, ensuring that the correct object is created based on different inputs.

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| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * Design Patterns and Principles | * 8 hrs. | * 8 hrs. |

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| **Day 25** |

**Design Patterns and Principles**

**Key Topics:** SOLID Principles

**Learn and Practice**

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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\36B80265.tmp | [Design Patterns in Java](https://cognizant.udemy.com/course/design-patterns-java)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 2:** SOLID Design Principles * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 26** |

**Design Patterns and Principles**

**Key Topics:** Commonly used Design Patterns

**Learn and Practice**

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| --- | --- |
| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\36B80265.tmp | [Design Patterns in Java](https://cognizant.udemy.com/course/design-patterns-java)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 3:** Builder * **Section 4:** Factories * **Section 6:** Singleton * **Section 7:** Adapter * **Section 10:** Decorator * **Section 13:** Proxy * **Section 21:** Observer * **Section 23:** Strategy * **Section 15:** Command * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 27** |

* This day has been included to accommodate the behavioral sessions.

**Stage 2: Milestone 2 - Problem Solving with Data Structures and Algorithms**

**Overview**

**Milestone 2 of Stage 2** focuses on Problem Solving with **Data Structures and Algorithms**, providing GenCs with a deep dive into fundamental data structures and algorithmic techniques. Through hands-on exercises, GenCs enhance their ability to analyze problems, design efficient algorithms, and implement solutions using the appropriate data structures.

**Learning Objectives**

After completing this milestone, GenCs will be able to

* Understand the importance of analyzing algorithms to determine their efficiency and suitability for different problem-solving scenarios.
* Learn various sorting algorithms and their application to efficiently arrange data in a specified order.
* Gain proficiency in using arrays to store and manipulate collections of data elements efficiently.
* Understand the concept and implementation of linked lists and their advantages over arrays in dynamic data storage.
* Learn different searching algorithms to locate specific elements within a collection of data effectively.

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| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * Data Structures and Algorithms | * 8 hrs. | * 8 hrs. |

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| **Day 28** |

**Design Patterns and Principles**

**Key Topics:** Architectural Patterns

**Learning References**

**Explore and Learn about MVC and Dependency Injection from the below links:**

* [Model View Controller (MVC)](https://www.geeksforgeeks.org/mvc-design-pattern/)
* [Dependency Injection (DI)](https://www.digitalocean.com/community/tutorials/java-dependency-injection-design-pattern-example-tutorial)

**Data Structures and Algorithms**

**Key Topics:** Analysis of Algorithms, Arrays, Sorting

**Learn and Practice**

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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\D98746BB.tmp | [Data Structures and Algorithms: Deep Dive Using Java](Data%20Structures%20and%20Algorithms:%20Deep%20Dive%20Using%20Java)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 1:** Introduction * **Section 2:** Arrays and Big-O Notation * **Section 3:** Sort Algorithms * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 29** |

**Data Structures and Algorithms**

**Key Topics:** Linked List, Searching

**Learn and Practice**

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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\D98746BB.tmp | [Data Structures and Algorithms: Deep Dive Using Java](Data%20Structures%20and%20Algorithms:%20Deep%20Dive%20Using%20Java) |
|  | * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 4:** Lists * **Section 8:** Search Algorithms * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac

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**Stage 2: Milestone 3 - Spring with Maven**

**Overview**

**Milestone 3 of Stage 2** focuses on **Spring Core with Maven**, a crucial aspect of Java development. This milestone introduces GenCs to the fundamentals of Spring Core, including dependency injection, inversion of control, and bean lifecycle management. Maven, a powerful build automation tool, is also covered, teaching GenCs how to manage project dependencies and build processes efficiently. By the end of this milestone, GenCs will have a strong foundation in using Spring Core with Maven to develop robust and maintainable Java applications.

**Learning Objectives**

After completing this milestone, GenCs will be able to

* Understand the core concepts of the Spring Framework, its history, and its significance in modern Java development.
* Learn to create and configure a new Spring project using Maven as the build tool, ensuring a proper project structure and dependencies.
* Gain a deep understanding of the Spring Inversion of Control (IoC) container and its role in managing Java objects.
* Explore various ways to configure Spring beans, including XML-based and annotation-based configurations.
* Understand the concept of Dependency Injection (DI) in Spring and how it helps in achieving loose coupling between components.
* Learn the basics of Aspect-Oriented Programming (AOP) and how Spring AOP enables cross-cutting concerns in your application.
* Understand the Spring MVC framework for building web applications and the integration of Object-Relational Mapping (ORM) tools like Hibernate with Spring.
* Get an overview of Spring Boot and its features, including the ability to quickly set up and run Spring-based applications with minimal configuration.

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| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * Spring Core and Maven | * 16 hrs. | * 24 hrs. |

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| **Day 30** |

**Spring Core and Maven**

**Key Topics:** Introduction to Spring Framework, Setting up a Spring Project with Maven, Spring IoC Container

**Learn and Practice**

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| 4FCA95A2 | [Spring Framework In Easy Steps](https://cognizant.udemy.com/course/springframeworkineasysteps)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 3:** Spring Core Concepts * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

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| 4FCA95A2 | [Maven Crash Course](https://cognizant.udemy.com/course/mavencrashcourse)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 1:** Introduction * **Section 2:** Simple Software Setup * **Section 3:** Maven Project Creation and Key Concepts * **Section 4:** Maven in Eclipse * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 31** |

**Spring Core and Maven**

**Key Topics:** Spring Bean Configuration

**Learn and Practice**

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| 4FCA95A2 | [Spring Framework in Easy Steps](https://cognizant.udemy.com/course/springframeworkineasysteps/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 5:** Life Cycle Methods * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 32** |

**Spring Core and Maven**

**Key Topics:** Dependency Injection in Spring

**Learn and Practice**

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| 4FCA95A2 | [Spring Framework in Easy Steps](https://cognizant.udemy.com/course/springframeworkineasysteps/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 4:** Setter Injection * **Section 6:** Dependency Check, Inner beans and Scopes * **Section 7:** Constructor Injection * **Section 9:** Auto-Wiring * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 33** |

**Spring Core and Maven**

**Key Topics:** Spring AOP (Aspect-Oriented Programming)

**Learn and Practice**

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| 4FCA95A2 | [Spring Framework in Easy Steps](https://cognizant.udemy.com/course/springframeworkineasysteps/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 22:** Spring AOP * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 34** |

**Spring Core and Maven**

**Key Topics:** Spring MVC and ORM

**Learn and Practice**

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| 4FCA95A2 | [Spring Framework in Easy Steps](https://cognizant.udemy.com/course/springframeworkineasysteps/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 20:** Spring MVC and ORM * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 35** |

**Spring Core and Maven**

**Key Topics:** Spring Boot (Introduction)

**Learn and Practice**

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| 4FCA95A2 | [Spring Framework in Easy Steps](https://cognizant.udemy.com/course/springframeworkineasysteps/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 25:** Spring Boot * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Code Challenge (For Practice Only)**

Attempt the following Code Challenge through the Learning Path for checking your skill level on Spring Framework. There will be only 3 attempts and you have to acquire 70% in order to clear this challenge.

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|  | Do not copy paste the code. Write the code yourself. |

* Code Challenge - Spring Framework

**IDP - Project Activities**

**Use Case Documentation Review**

* In these days, you should review use case review and rework.

**Stage 2: Milestone 4 - TDD**

**Overview**

**Milestone 3 of Stage 2** focuses on Test-Driven Development (TDD) using JUnit and Mockito. TDD is a software development process that relies on writing tests before writing the actual code. In this milestone, learners will explore how to write unit tests using JUnit, a popular Java testing framework, to ensure that their code meets the expected behavior. Additionally, they will learn how to use Mockito, a mocking framework, to create mock objects for testing dependencies. Through hands-on exercises and practical examples, learners will gain a thorough understanding of TDD principles and how to apply them in their Java projects.

**Learning Objectives**

After completing this milestone, GenCs will be able to

* Understand the concept of Test-Driven Development (TDD) and its benefits in software development.
* Learn the basics of JUnit framework, including writing and executing test cases for Java code.
* Explore advanced features of JUnit, such as parameterized tests, test suites, and custom annotations.
* Gain an understanding of Mockito framework for creating and using mock objects in unit tests.
* Learn how to test Spring applications using JUnit for unit testing and Mockito for mocking dependencies.
* Understand the concept of mocking external dependencies in unit tests using Mockito to isolate components for testing.

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| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * Spring Core and Maven | * 8 hrs. | * 12 hrs. |

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| **Day 36** |

**TDD using JUnit and Mockito**

**Key Topics:** Introduction to Test-Driven Development (TDD), Getting Started with JUnit, Advanced JUnit Features

**Learn and Practice**

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| 4FCA95A2 | [Learn Java Unit Testing with Junit & Mockito in 30 Steps](https://cognizant.udemy.com/course/mockito-tutorial-with-junit-examples/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 2:** Unit Testing with JUnit * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 37** |

**TDD using JUnit and Mockito**

**Key Topics:** Mockito Basics, Testing Spring Applications with JUnit and Mockito

**Learn and Practice**

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| 4FCA95A2 | [Learn Java Unit Testing with Junit & Mockito in 30 Steps](https://cognizant.udemy.com/course/mockito-tutorial-with-junit-examples/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 3:** Getting Ready for Mockito * **Section 4:** Need for Mockito * **Section 5:** Mockito Basics * **Section 6:** Mockito Advanced * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 38 - Forenoon** |

**TDD using JUnit and Mockito**

**Key Topics:** Mocking External Dependencies

**Learn and Practice**

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| --- | --- |
| 4FCA95A2 | [Learn Java Unit Testing with Junit & Mockito in 30 Steps](https://cognizant.udemy.com/course/mockito-tutorial-with-junit-examples/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 6:** Mockito Advanced * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Code Challenges (For Practice Only)**

Attempt the following Code Challenges through the Learning Path for checking your skill level on user TDD and Code Quality. There will be only 3 attempts and you have to score 70% in order to clear this challenge.

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|  | Do not copy paste the code. Write the code yourself. |

* Code Challenge - TDD, Junits
* Code Challenge - Code Quality

**Stage 2: Milestone 5 - Logging and Continuous Code Quality**

**Overview**

In **Milestone 5 of Stage 2**, the focus is on **Logging and Continuous Code Quality using SLF4J, Lombok, and SonarQube.** SLF4J serves as a simple facade or abstraction for various logging frameworks, allowing GenCs to switch between implementations easily. Lombok is a library that helps reduce boilerplate code in Java, improving code readability and maintainability. SonarQube is a platform for continuous inspection of code quality, providing static analysis to detect bugs, vulnerabilities, and code smells. Together, these tools enable GenCs to log application events effectively, reduce redundant code, and maintain high standards of code quality throughout the development process.

**Learning Objectives**

After completing this milestone, GenCs will be able to

* Understand the role of SLF4J and Lombok in Java development, and learn how to integrate and use them to improve code readability, maintainability, and efficiency.
* Learn how to implement and utilize SonarQube to continuously analyze code quality, identify issues, and ensure adherence to coding standards, thereby improving overall software quality and maintainability.

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| --- | --- | --- |
| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * SLF4J and Lombok | * N/A | * 8 hrs. |
| * Code Quality Standards | * 4 hrs. | * N/A |
| * SonarQube | * N/A | * 8 hrs. |

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| **Day 38 - Afternoon, 39 - Forenoon** |

**SLF4J and Lombok**

**Key Topics:** SLF4J vs. Log4J vs. Lombok

**Learning Reference**

Practice the sample programs and code snippets provided in the following links.

* [Lombok @Log4j, @Slf4j and Other Log Annotations](http://www.javabyexamples.com/lombok-log4j-slf4j-and-other-log-annotations)

**Hands On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 39 - Afternoon** |

**Code Quality Standards**

**Key Topics:** Continuous Code Quality

**Learning Reference**

* [Continuous Code Quality using SonarQube](https://www.youtube.com/watch?v=y8UF7rgtDEo)

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| **Day 40** |

**SonarQube**

**Key Topics:** SONAR Intro, Sonar architecture, Usage of SonarQube

**Learn and Practice**

Walk through the following videos to practice SonarQube.

* [SonarQube - Part 1](https://www.youtube.com/watch?v=y8UF7rgtDEo&t=3070s)
* [SonarQube - Part 2](https://www.youtube.com/watch?v=Wz942rhkEbI&t=1276s)
* [SonarQube - Part 3](https://www.youtube.com/watch?v=bNz80D4qErk&t=646s)
* [SonarQube - Part 4](https://www.youtube.com/watch?v=SinGHAHwpUw&t=1s)
* [SonarQube - Part 5](https://www.youtube.com/watch?v=Db353dXxENU)
* [SonarQube - Part 6](https://www.youtube.com/watch?v=wLEf_tBxDIQ)

**IDP - Project Activities**

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| **Day 41** |

**Internal Demo and Rework**

* This day can be utilized for Internal Demo & Re-work

**Stage 3 - Backend Development and Microservices with Spring Boot and Spring Cloud**

**Overview**

**Stage 3** of the training delves into advanced backend development skills with a focus on Java and Spring Boot. GenCs will learn about using GIT for version control to manage source code effectively. They will also gain expertise in debugging backend applications, learning techniques to identify and resolve issues efficiently. The training covers Spring Data JPA with Spring Boot and Hibernate, enabling GenCs to interact with relational databases seamlessly. Additionally, they will master building RESTful web services using Spring Boot 3, a framework highly regarded for Java-based applications. The stage culminates with a deep dive into microservices architecture, where GenCs will learn to design and implement microservices using Spring Boot 3 and Spring Cloud, providing them with the necessary tools for building and deploying microservices-based applications.

As part of **Stage 3** of your training, the following skills will be covered.

* GIT
* Application Debugging - Backend
* Spring Data JPA with Spring Boot, Hibernate
* Spring REST using Spring Boot 3
* Microservices with Spring Boot 3 and Spring Cloud

**How and From Where to Learn?**

* You can learn from the sources as they are mentioned in this learning guide.

**Integrated Development Project (IDP) Roadmap**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phases** | **Duration** | **Activities** | **Deliverables** |
| * Internal Demo & Re-work | * 8 hrs. | * Evaluation & Re-work (if any) | * N/A |
| * Microservices Implementation | * 24 hrs. | * Implement backend of the project | * Final Project Code base |

**Stage 3: Milestone 1 - DSVN**

**Overview**

In **Milestone 1 of Stage 3**, you will dive into the fundamental skill of version control using **Git**. Git is a distributed version control system that allows you to track changes to your codebase, collaborate with other developers, and manage different versions of your project. You will learn the basics of Git, including setting up a repository, committing changes, branching and merging, resolving conflicts, and working with remote repositories. Understanding Git is essential for any developer, as it provides a solid foundation for managing and collaborating on projects effectively.

**Learning Objectives**

After completing this milestone, GenCs will be able to

* Understand the concept of version control and its importance in managing project files and code changes efficiently.
* Gain a comprehensive understanding of Git, including its features, advantages, and how it differs from other version control systems.
* Learn how to set up Git on your local machine, including configuring user details and initializing a new Git repository.
* Familiarize yourself with basic Git commands such as git add, git commit, and git status to track changes and manage your repository.
* Learn the concepts of branching and merging in Git to manage different versions of your code and collaborate with team members effectively.
* Understand the concept of remote repositories and learn how to work with remote repositories in Git for collaboration and backup purposes.
* Learn how to collaborate with team members using Git, including pushing and pulling changes to and from remote repositories, resolving conflicts, and reviewing code.

|  |  |  |
| --- | --- | --- |
| **Courses/Skills** | **Learning Duration** | **Practice Duration** |
| * Spring Core and Maven | * 8 hrs. | * 12 hrs. |

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| **Day 42** |

**GIT**

**Key Topics:** Introduction to Version Control, Understanding Git, Setting Up Git, Basic Git Commands, Branching and Merging, Remote Repositories, Collaborating with Git

**Learn and Practice**

|  |  |
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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [The Git & Github Bootcamp](https://cognizant.udemy.com/course/git-and-github-bootcamp) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 2:** Introducing…Git! * **Section 3:** Installation & Setup * **Section 4:** The Very Basics Of Git: Adding & Committing * **Section 5:** Commits In Detail (And Related Topics) * **Section 6:** Working With Branches * **Section 7:** Merging Branches, Oh Boy! * **Section 8:** Comparing Changes With Git Diff * **Section 14:** Git Collaboration Workflows   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

Click on the link provided and delve into the content to enhance your understanding.

* [Git Reference](https://www.geeksforgeeks.org/git-tutorial/)

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Stage 3: Milestone 2 - Application Debugging**

**Overview**

In **Milestone 2 of Stage 3**, you will delve into the essential skill of debugging Spring Boot applications, particularly focusing on REST APIs. Debugging is a critical aspect of software development, allowing you to identify and fix issues in your code efficiently. You will learn how to set up debugging in a Spring Boot application using popular IDEs like IntelliJ IDEA or Eclipse, enabling you to step through your code, inspect variables, and understand the flow of execution.

**Learning Objectives**

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| **Day 43** |

**Application Debugging - Backend**

**Key Topics:** Debugging Fundamentals, Debugging REST Endpoints, Debugging Asynchronous Code

**Learn and Practice**

* Go through the video and download the code from the Tekstac platform. Debug the application as per the video in the Milestone and do the hands-on.

**Demo Video**

1. Eclipse\_Debugging.mp4 - Basic application debugging concepts using eclipse

**Additional Learning**

|  |  |
| --- | --- |
| 4FCA95A2 | [Eclipse Debugging Techniques And Tricks](https://cognizant.udemy.com/course/eclipse-debugging-techniques-and-tricks/)   * Go through the entire course. |

Click on the link provided and delve into the content to enhance your understanding.

* [Debugging Spring Applications](https://www.baeldung.com/spring-debugging)
* [Spring Boot – @Async Annotation](https://www.geeksforgeeks.org/spring-boot-async-annotation/)

**Stage 3: Milestone 3 - Java Persistence API, ORM Frameworks**

**Overview**

In Milestone 3 of Stage 3, you will delve into Spring Data JPA integration with Spring Boot 3, leveraging Hibernate as the JPA provider to streamline data access layer development in Spring applications. This integration simplifies database interactions by abstracting underlying data access technologies and providing a repository-based programming model. You will explore entity mapping using JPA annotations, repository interfaces for CRUD operations, custom query methods for data retrieval, derived queries from method names, and features like pagination, sorting, auditing, and transaction management. By the end of this milestone, you will have a comprehensive understanding of how to harness the power of Spring Data JPA with Spring Boot 3 and Hibernate to build efficient and robust data access layers for your applications.

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| **Day 44** |

**Spring Data JPA with Spring Boot, Hibernate**

**Key Topics:** Introduction to Spring Data JPA, Setting Up a Spring Boot Project with Spring Data JPA

**Learn and Practice**

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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [Hibernate and Spring Data JPA: Beginner to Guru](https://cognizant.udemy.com/course/hibernate-and-spring-data-jpa-beginner-to-guru) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 2:** Introduction to Spring Data JPA * **Section 5:** Hibernate with MySQL   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Spring Data JPA**.

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| **Day 45** |

**Spring Data JPA with Spring Boot, Hibernate**

**Key Topics:** Entity Mapping, Spring Data Repositories, CRUD Operations with Spring Data JPA

**Learn and Practice**

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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [Hibernate and Spring Data JPA: Beginner to Guru](https://cognizant.udemy.com/course/hibernate-and-spring-data-jpa-beginner-to-guru) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 16:** Database Relationship Mapping   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

Click on the link provided and delve into the content to enhance your understanding.

* [JPA Repositories](https://docs.spring.io/spring-data/jpa/docs/1.6.0.RELEASE/reference/html/jpa.repositories.html)
* [Spring Boot JPA CRUD with Example](https://medium.com/javarevisited/spring-boot-jpa-crud-with-example-bbd219b5d4a6)

**Learning Reference: Code Demo**

* [Spring Data JPA Code Demo](https://cognizant.kpoint.com/web/videos/gcc-2b12db0e-267a-414b-9436-f0692e909dfa?vsrc=shm)

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| **Day 46** |

**Spring Data JPA with Spring Boot, Hibernate**

**Key Topics:** Query Methods and Named Queries, Pagination and Sorting

**Learn and Practice**

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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [Hibernate and Spring Data JPA: Beginner to Guru](https://cognizant.udemy.com/course/hibernate-and-spring-data-jpa-beginner-to-guru) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 13:** Spring Data JPA Queries * **Section 14:** Paging and Sorting   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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| **Day 47** |

**Spring Data JPA with Spring Boot, Hibernate**

**Key Topics:** Auditing with Spring Data JPA, Spring Data JPA Projections

**Learn and Practice**

Click on the link provided and delve into the content to enhance your understanding.

* [Auditing with JPA, Hibernate, and Spring Data JPA](https://www.baeldung.com/database-auditing-jpa)
* [Spring Data JPA Projections](https://www.baeldung.com/spring-data-jpa-projections)

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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| **Day 48** |

**Spring Data JPA with Spring Boot, Hibernate**

**Key Topics:** Spring Data JPA and Spring Boot Integration, Spring Data JPA and Hibernate

**Learn and Practice**

Click on the link provided and delve into the content to enhance your understanding.

* [How to use Spring Data JPA in Spring Boot Project](https://www.javaguides.net/2021/12/how-to-use-spring-data-jpa-in-spring-boot-project.html)
* [Spring Data JPA vs Hibernate](https://medium.com/@burakkocakeu/spring-data-jpa-vs-hibernate-1dde8f2a1113)

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Code Challenges (For Practice Only)**

Attempt the following Code Challenges through the Learning Path for checking your skill level on user Spring Data JPA. There will be only 3 attempts and you have to score 70% in order to clear this challenge.

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|  | Do not copy paste the code. Write the code yourself. |

* Code Challenge :Spring Data JPA with Spring Boot

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Spring Data JPA**.

**Stage 3: Milestone 4 - RESTful API**

**Overview**

Milestone 4 of Stage 3 covers Spring REST using Spring Boot 3. In this milestone, participants will learn about building RESTful web services using the Spring Framework, specifically focusing on the latest version, Spring Boot 3. Spring Boot is a popular framework for rapidly developing and deploying Java-based web applications.

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| **Day 49** |

**Spring REST using Spring Boot 3**

**Key Topics:** Introduction to Spring REST and Spring Boot 3, Building a Simple REST Controller

**Learn and Practice**

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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [Building Real-Time REST APIs with Spring Boot - Blog App](https://cognizant.udemy.com/course/building-real-time-rest-apis-with-spring-boot) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 3:** REST Basics and Key Concepts (For Beginners) * **Section 4:** Spring Boot REST API Development Basics - Important Annotations   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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| **Day 50** |

**Spring REST using Spring Boot 3**

**Key Topics:** Request and Response Handling, RESTful Resource Representation with DTOs

**Learn and Practice**

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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [Building Real-Time REST APIs with Spring Boot - Blog App](https://cognizant.udemy.com/course/building-real-time-rest-apis-with-spring-boot) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 6:** Building CRUD REST API’s for Post Resource * **Section 9:** Using ModelMapper-Map Entity to DTO and Vice Versa   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 51** |

**Spring REST using Spring Boot 3**

**Key Topics:** RESTful HATEOAS, Content Negotiation and Media Types

**Learn and Practice**

Click on the link provided and delve into the content to enhance your understanding.

* [Building a Hypermedia-Driven RESTful Web Service](https://spring.io/guides/gs/rest-hateoas)
* [Spring Boot REST Web Services Content Negotiation](https://maheshbonagiri.medium.com/spring-boot-and-content-negotiation-183b20eaa425)

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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| **Day 52** |

**Spring REST using Spring Boot 3**

**Key Topics:** Spring Boot Actuator for REST Monitoring, Security and Authentication in RESTful APIs

**Learn and Practice**

Click on the link provided and delve into the content to enhance your understanding.

* [Spring Boot Actuator](https://www.baeldung.com/spring-boot-actuators)
* [Authentication and Authorization in Spring Boot 3.0 with Spring Security](https://www.geeksforgeeks.org/authentication-and-authorization-in-spring-boot-3-0-with-spring-security/)

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 53** |

**Spring REST using Spring Boot 3**

**Key Topics:** Testing RESTful APIs, Documenting RESTful APIs

**Learn and Practice**

|  |  |
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| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [Building Real-Time REST APIs with Spring Boot - Blog App](https://cognizant.udemy.com/course/building-real-time-rest-apis-with-spring-boot) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 18:** REST API Documentation using SpringDoc OpenAPI in Spring Boot 3   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

Click on the link provided and delve into the content to enhance your understanding.

* [Spring Boot Unit Testing REST APIs Tutorial](https://www.codejava.net/frameworks/spring-boot/unit-testing-rest-apis-tutorial)

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**IDP - Project Activities**

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| **Day 54** |

**Internal Demo and Rework**

* This day can be utilized for Internal Demo & Re-work

**Stage 3: Milestone 5 - Microservices**

**Overview**

Milestone 5 of Stage 3 covers Microservices with Spring Boot 3 and Spring Cloud. This milestone focuses on introducing participants to building microservices-based applications using Spring Boot 3 and Spring Cloud. It covers fundamental concepts of microservices architecture, including modularity, scalability, resilience, and decentralized data management. Participants will learn how Spring Boot 3 simplifies the development of microservices with its auto-configuration and opinionated defaults. Additionally, they will explore how Spring Cloud complements Spring Boot by providing tools for building distributed systems, such as service discovery, circuit breakers, and distributed tracing. The milestone includes practical examples and hands-on exercises to reinforce learning.

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| **Day 55** |

**Microservices with Spring Boot 3 and Spring Cloud**

**Key Topics:** Introduction to Microservices Architecture (MSA), Spring Cloud for Microservices

**Learn and Practice**

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| --- | --- |
| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [[NEW] Building Microservices with Spring Boot & Spring Cloud](https://cognizant.udemy.com/course/building-microservices-with-spring-boot-and-spring-cloud) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 10:** Microservices Introduction * **Section 11:** Building Microservices   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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| **Day 56** |

**Microservices with Spring Boot 3 and Spring Cloud**

**Key Topics:** Microservices Communication with Spring Cloud, API Gateway and Edge Services

**Learn and Practice**

|  |  |
| --- | --- |
| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [[NEW] Building Microservices with Spring Boot & Spring Cloud](https://cognizant.udemy.com/course/building-microservices-with-spring-boot-and-spring-cloud) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 13:** Microservices Communication * **Section 15:** API Gateway using Spring Cloud Gateway   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 57** |

**Microservices with Spring Boot 3 and Spring Cloud**

**Key Topics:** Spring Cloud Config

**Learn and Practice**

|  |  |
| --- | --- |
| C:\Users\690417\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4FCA95A2.tmp | [[NEW] Building Microservices with Spring Boot & Spring Cloud](https://cognizant.udemy.com/course/building-microservices-with-spring-boot-and-spring-cloud) |
|  | * + Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 16:** Centralized Configurations using Spring Cloud Config Server * **Section 17:** Auto Refresh Config Changes using Spring Cloud Bus   + Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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| **Day 58** |

**Microservices with Spring Boot 3 and Spring Cloud**

**Key Topics:** Monitoring and Metrics in Microservices

**Learn and Practice**

Click on the link provided and delve into the content to enhance your understanding.

* [Monitoring Spring Boot Microservices with Prometheus](https://medium.com/@bubu.tripathy/monitoring-spring-boot-microservices-with-prometheus-694dd22f8826)
* [Monitoring Made Simple: Empowering Spring Boot Applications with Prometheus and Grafana](https://medium.com/simform-engineering/revolutionize-monitoring-empowering-spring-boot-applications-with-prometheus-and-grafana-e99c5c7248cf)

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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| **Day 59** |

**Microservices with Spring Boot 3 and Spring Cloud**

**Key Topics:** Security Best Practices in Microservices

**Learn and Practice**

Click on the link provided and delve into the content to enhance your understanding.

* [Role-Based Access Control with Spring Security](https://medium.com/@bubu.tripathy/role-based-access-control-with-spring-security-ca59d2ce80b0)
* [Learn How to Secure Service-to-Service Microservices](https://dzone.com/articles/learn-how-to-secure-service-to-service-microservic)

**Hands-On**

Complete the following hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**IDP - Project Activities**

|  |
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| **Day 60, 61,62** |

**Microservices Implementation**

* These days will be spent on the following IDP development activity.
* Implement Microservices using Spring Cloud

**Interim Evaluation**

|  |
| --- |
| **Day 63** |

**Interim Evaluation (Project + Technical)**

* Interim evaluation will be conducted on this day, and the mode will be a video interview on the Tekstac platform. There will be ONLY one attempt.

**Stage 4 - Frontend Development and Cloud Technologies**

**Overview**

**Stage 4** deals with the Niche skills such as Angular or React, Docker, Cloud and DevOps basics using AWS which are seminal while developing/maintaining various software applications. We provide unique learning experience to learners by including diversified learning content and learning methodologies that are based on adult learning principles.

As part of **Stage 4** of your training, the following skills will be covered.

* Docker basics
* Cloud and DevOps Basics using AWS
* Angular OR React
* Application Debugging - Front-end

**How and From Where to Learn?**

* You can learn from the sources as they are mentioned in this learning guide.

**Integrated Development Project (IDP) Roadmap**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phases** | **Duration** | **Activities** | **Deliverables** |
| * Integration | * 8 hrs. | * Integrating UI with the REST API | * Front-End Application |
| * Evaluation | * 16 hrs. | * Final Project Demo * Evaluation & Re-work (if any) | * Final Project Code base * Sprint Backlog * PPT |

**Stage 4: Milestone 1 - Containerization**

**Overview**

This module introduces learners to Docker, a popular containerization platform used in modern application development. Docker allows developers to package applications and their dependencies into containers, which can run consistently across different environments. The module covers key concepts such as Docker containers, images, volumes, and networking. Learners will understand the benefits of Docker, including improved portability, scalability, and efficiency in resource utilization. They will also learn how to create, manage, and deploy Docker containers, making it easier to build, ship, and run applications in a consistent and isolated environment.

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| **Day 64** |

**Docker Basics**

**Key Topics:** Introduction, Docker Commands. Docker Run, Docker Images, Docker Compose

**Learn and Practice**

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| 4FCA95A2 | [Docker for the Absolute Beginner - Hands On - DevOps](https://cognizant.udemy.com/course/learn-docker)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 1:** Introduction * **Section 2:** Docker Commands * **Section 3:** Docker Run * **Section 4:** Docker Images * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 65** |

**Docker Basics**

**Key Topics:** Docker Registry, Docker Engine, Docker Storage, Docker Networking, Container Orchestration

**Learn and Practice**

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| --- | --- |
| 4FCA95A2 | [Docker for the Absolute Beginner - Hands On - DevOps](https://cognizant.udemy.com/course/learn-docker)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 6:** Docker Registry * **Section 7:** Docker Engine, Storage and Networking * **Section 9:** Container Orchestration - Docker Swarm & Kubernetes * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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**Stage 4: Milestone 2 - Cloud and DevOps**

**Overview**

Milestone 2 of Stage 4 training focuses on cloud and DevOps practices using AWS. This milestone covers topics related to cloud computing, including the delivery of computing services over the internet, and AWS-specific services for computing power, storage, content delivery, and more. It also delves into DevOps practices, which aim to automate and integrate software development and IT operations processes for faster deployment and continuous delivery. The milestone includes hands-on exercises and practical scenarios to reinforce learning in these areas.

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| **Day 66** |

**Cloud and DevOps Basics using AWS**

**Key Topics:** Introduction to Cloud Computing, Cloud Service Models, Cloud Deployment Models, Cloud Service Providers, Advantages of Cloud Computing and various services provided by AWS, Introduction to AWS, AWS Compute Services, AWS Storage Services

|  |  |
| --- | --- |
| 4FCA95A2 | [Introduction to Cloud Computing on AWS for Beginners [2024]](https://cognizant.udemy.com/course/introduction-to-cloud-computing-on-amazon-aws-for-beginners)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. course   + **Section 3:** IT Fundamentals   + **Section 4:** Cloud Computing Concepts   + **Section 6:** Amazon EC2, Auto Scaling, and Load Balancing   + **Section 7:** AWS Storage Services * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 67** |

**Cloud and DevOps Basics using AWS**

**Key Topics:**  AWS Networking, AWS Database Services, AWS Identity and Access Management (IAM), AWS Serverless Computing

|  |  |
| --- | --- |
| 4FCA95A2 | [Introduction to Cloud Computing on AWS for Beginners [2024]](https://cognizant.udemy.com/course/introduction-to-cloud-computing-on-amazon-aws-for-beginners)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. course   + **Section 5:** AWS Access Control and Networking   + **Section 8:** AWS Database Services   + **Section 11:** Containers and Serverless Computing * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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| **Day 68** |

**Cloud and DevOps Basics using AWS**

**Key Topics:** Introduction, AWS CodeCommit, AWS CodeBuild, AWS CodeDeploy, AWS CodePipeline

|  |  |
| --- | --- |
| 4FCA95A2 | [DevOps , CI/CD(Continuous Integration/Delivery for Beginners](https://cognizant.udemy.com/course/ci-cd-devops)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. course   + **Section 1:** The Basics – CI, CD and DevOps * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

|  |  |
| --- | --- |
| 4FCA95A2 | [AWS CodePipeline Step by Step](https://cognizant.udemy.com/course/aws-codepipeline-step-by-step)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. course   + **Section 1:** Introduction - AWS CodePipeline Basics   + **Section 2:** Using AWS CodeCommit Repositories as Source Locations   + **Section 3:** Building Your Code With AWS CodeBuild   + **Section 4:** Deploying to EC2 Instances With AWS CodeDeploy * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Stage 4: Milestone 3 - Front-End JS Framework/Library**

**Overview**

Milestone 2 of the Stage 4 training focuses on **Angular/React**; two popular front-end JavaScript frameworks used for building modern web applications. In this milestone, learners will delve into advanced concepts and best practices for developing robust and scalable applications using Angular /React. By the end of this module, learners will gain the skills needed to design and develop complex front-end applications with Angular and React, enhancing their proficiency in modern web development.

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| **Day 69** |

**Angular**

**Key Topics:** Introduction to Angular

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Angular – The complete guide](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. course   + **Section 1:** Getting started * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**React**

**Key Topics:** Introduction to React

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 1:** Getting Started * **Section 2:** JavaScript Refresher * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

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| **Day 70** |

**Angular**

**Key Topics:** Angular Basics

**Learn and Practice**

|  |  |
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| 4FCA95A2 | [Angular – The complete guide](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 2:** The Basics   + **Section 3:** Course Project - The Basics * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

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**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**React**

**Key Topics:** React Components

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 3:** React Essentials - Components, JSX, Props, State & More * **Section 14:** An Alternative Way Of Building Components: Class-based Components * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

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| **Day 71** |

**Angular**

**Key Topics:** Components and Templates

**Learn and Practice**

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| --- | --- |
| 4FCA95A2 | [Angular – The complete guide](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 5:** Components & Data Binding Deep Dive   + **Section 6:** Course Project - Components & Data Binding   + **Section 7:** Directives Deep Dive   + **Section 8:** Course Project – Directives   + **Section 17:** Using Pipes to Transform Output * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**React**

**Key Topics:** State Management

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 4:** React Essentials - Deep Dive * **Section 5:** React Essentials - Practice Project * **Section 8:** Working with Refs and Portals * **Section 9:** Practice Project: Project Management App (with Components, State, Refs & More) * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

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| **Day 72** |

**Angular**

**Key Topics:** Services and Dependency Injection

**Learn and Practice**

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| --- | --- |
| 4FCA95A2 | [Angular – The complete guide](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. course   + **Section 9:** Using Services & Dependency Injection * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**React**

**Key Topics:** React Hooks

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 11:** Handling Side Effects & Working with the useEffect() Hook * **Section 12:** Practice Project: Building a Quiz App * **Section 16:** Building Custom React Hooks * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

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| **Day 73** |

**Angular**

**Key Topics:** Routing and Navigation

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Angular – The complete guide](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 11:** Changing Pages with Routing * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**Code Challenge (For Practice Only)**

Take on the following Code Challenge in the Tekstac Learning Path to assess your skill level in Angular. You will have 3 attempts, and you must score 70% or higher to pass this challenge.

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|  | Do not copy paste the code. Write the code yourself. |

* Code Challenge: Angular

**React**

**Key Topics:** React Router

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 21:** Building a Multi-Page SPA with React Router * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

**Code Challenge (For Practice Only)**

Take on the following Code Challenge in the Tekstac Learning Path to assess your skill level in React. You will have 3 attempts, and you must score 70% or higher to pass this challenge.

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|  | Do not copy paste the code. Write the code yourself. |

* Code Challenge: React

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| **Day 74** |

**Angular**

**Key Topics:** Forms and Validations

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Angular – The complete guide](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 15:** Handling Forms in Angular Apps   + **Section 16:** Course Project - Forms * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**React**

**Key Topics:** Forms and Controlled Components

**Learn and Practice**

|  |  |
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| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 17:** Working with Forms & User Input * **Section 18:** Practice Project: Building a Food Order App * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

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| **Day 75** |

**Angular**

**Key Topics:** Http and Observables

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Angular – The complete guide](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 18:** Making Http Requests   + **Section 19:** Course Project - Http   + **Section 13:** Understanding Observables   + **Section 14:** Course Project - Observables * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

|  |  |
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|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**React**

**Key Topics:** HTTP Requests and Data Fetching

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Modern React with Redux [2024 Update]](https://cognizant.udemy.com/course/react-redux)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 5:** Using an API with React * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

|  |  |
| --- | --- |
|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

|  |
| --- |
| **Day 76** |

**Angular**

**Key Topics:** Angular Material

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Complete Angular 11 - Ultimate Guide - with Real World App](https://cognizant.udemy.com/course/complete-angular-indepth-easy)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 20:** Angular Material (New) * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

|  |  |
| --- | --- |
|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**React**

**Key Topics:** State Management with Context API

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 10:** React's Context API & useReducer - Advanced State Management * **Section 19:** Diving into Redux (An Alternative To The Context API) * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

|  |  |
| --- | --- |
|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

|  |
| --- |
| **Day 77** |

**Angular**

**Key Topics:** Testing in Angular

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Angular - The Complete Guide (2024 Edition)](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 30:** A Basic Introduction to Unit Testing in Angular Apps * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

|  |  |
| --- | --- |
|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**React**

**Key Topics:** Testing in React

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 29:** Testing React Apps (Unit Tests) * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

|  |  |
| --- | --- |
|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

|  |
| --- |
| **Day 78** |

**Angular**

**Key Topics:** Deployment and Best Practices

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Angular - The Complete Guide (2024 Edition)](https://cognizant.udemy.com/course/the-complete-guide-to-angular-2)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope.   + **Section 22:** Angular Modules & Optimizing Angular Apps   + **Section 23:** Deploying an Angular Apps * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

|  |  |
| --- | --- |
|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **Angular**.

**React**

**Key Topics:** Deployment and Best Practices

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [React - The Complete Guide 2024 (incl. React Router & Redux)](https://cognizant.udemy.com/course/react-the-complete-guide-incl-redux/)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **Section 23:** Deploying React Apps * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Hands-On**

Complete the following set of hands-on given in the Learning Path at Tekstac.

|  |  |
| --- | --- |
|  | Do not copy paste the code. Write the code yourself. |

**Offline Hands-On (Additional Practice)**

* Try out the offline hands-on exercises given in the learning path on **React**.

**Stage 4: Milestone 3 - Application debugging - Frontend**

**Overview**

**Module 3** of the **Stage 4** training focuses on front-end application debugging in Angular or React. In this module, learners will gain essential skills in identifying and resolving issues in their front-end applications. They will learn debugging techniques specific to Angular or React, including using developer tools, logging, and debugging libraries. The module will cover common debugging scenarios such as troubleshooting errors, optimizing performance, and understanding application behavior.

|  |
| --- |
| **Day 79** |

**Application Debugging - Front-end**

**Key Topics:** Debugging Basics, Debugging Angular Applications, Debugging React Applications, Advanced Debugging Techniques

**Learn and Practice**

|  |  |
| --- | --- |
| 4FCA95A2 | [Devtools Pro: The Basics of Chrome Developer Tools](https://cognizant.udemy.com/course/devtools-2017-the-basics-of-chrome-developer-tools)   * Walkthrough the following Udemy course sections and focus on the corresponding topics within our training curriculum's technical scope. * **All** Sections * Ensure that you learn these topics through self-learning and practice alongside the course instructor. It is NOT necessary to cover every topic comprehensively within each section. |

**Demo Videos**

Watch the following demo videos provided in the platform for getting a complete picture about how to debug an/a Angular/React application using Chrome’s DevTools and VS Code Debugger.

**Note:** The below given Cognizant Kpoint videos can be accessed even after your Tekstac platform access is revoked.

* [Debugging Angular Part 1](https://cognizant.kpoint.com/app/video/gcc-2a51d737-459b-491e-9f2e-fc1497affa81)
* [Debugging Angular Part 2](https://cognizant.kpoint.com/app/video/gcc-36239c0b-e7e6-4d21-81b8-1c3ebc4505e9)

**IDP - Project Activities**

|  |
| --- |
| **Day 80** |

**Integration**

These days will be spent on the following IDP activity with the Trainer guidance.

* Integration of Front-end with Web API

**Final Evaluation**

|  |
| --- |
| **Day 81, 82** |

**Final Evaluation (Project + Technical)**

* Final Evaluation will be conducted on these days, and the mode will be a video interview on the Tekstac platform.

**Final Assessment**

|  |
| --- |
| **Day 83, 84 - Forenoon** |

**Final Assessment**

* **Prep & Assessment**

There will be a Final Assessment to evaluate on the key skills of the FSE curriculum.

**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**

|  |  |
| --- | --- |
| man staring at white sky taken at daytime | 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**

|  |  |
| --- | --- |
| woman covering her face with white book | 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**

|  |  |
| --- | --- |
| person holding pile of books near face | 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 Program (or) the Cognizant on-boarded GEN Cs can participate in this program.

1. **Is there any pre-learning I should do?**

No. This program is open to all students from any academic discipline.

1. **What is Code Challenge?**

A problem statement will be provided to you and you need to solve it using a single skill.

1. **What is 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.

1. **How many attempts are provided for the Coding challenge and ICTs?**

**Is it open all the time for practice?**

The Coding challenges and ICTs are open and there are 3 attempts to take them up.

1. **What are the entry criteria for qualifier?**

 A 100% hands-on completion and attempt in CC & ICT are the eligibility criteria for qualification.

1. **What skills are covered in the qualifier?**

The skills of Stage 1 are covered in the qualifier. Only ONE attempt is provided to clear with a minimum score of 70%

1. **What if I fail in the Interim evaluation?**

Your coach will notify your performance in the Interim evaluation. However, you can continue with the learning.

1. **How many chances will I get in the Final evaluation?**

You’ll get 2 chances in the Final evaluation which covers ALL the skills in the learning journey.

1. **Will we be provided with Projects to work on?**

No, you will have to ideate, design and develop the project which will be reviewed and assessed by the project mentor.

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

Coach is your point of contact.