Cognizant Academy

Full Stack Prep-up
Learning Guide
.Net Track

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

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

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

Program at a glance

Full Stack Prep-up Internship Program has 5 stages:

- Stage 1 (Week 1 – Week 3)
- Stage 2 (Week 4 – Week 7)
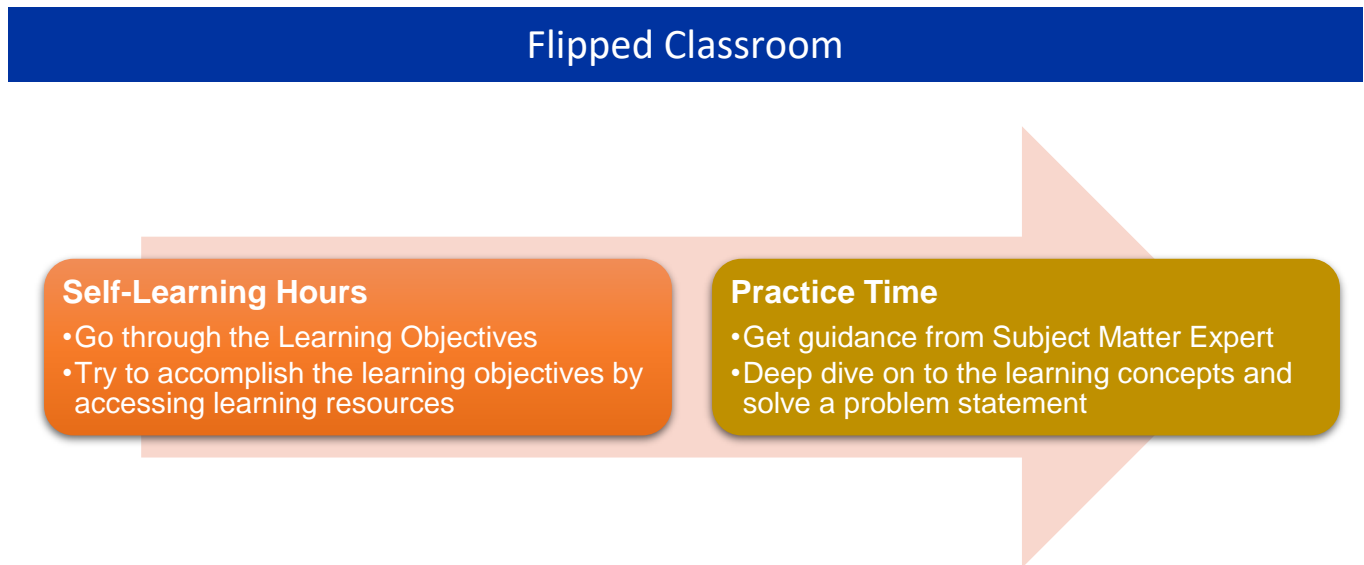- Full Stack Prep-up Modules (Week 8 – Week 18)

Program Highlights

- The complete learning journey is formalized using adult learning principles, where problem solving and applying the skills gained are given more importance than conceptual learning.

- Learner Autonomy is implemented via Flipped Classroom, where the learning platform offers world class learning resources, and students would not be constrained by tutelage of an instructor.

- Get mentored by Subject Matter Experts, whose motivation and guidance will help you accelerate in the learning journey.

Learning Journey with Flipped Classroom

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

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

Flipped Classroom

Self-Learning Hours
- Go through the Learning Objectives
- Try to accomplish the learning objectives by accessing learning resources

Practice Time
- Get guidance from Subject Matter Expert
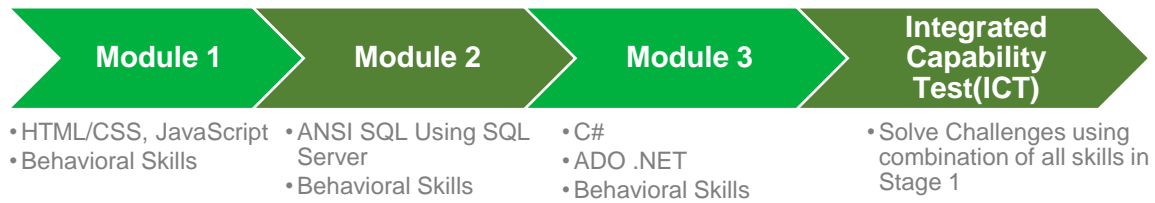- Deep dive on to the learning concepts and solve a problem statement

Recommended Program Sequence

The learning journey starts with **9 days of Icebreaker sessions** followed by a technical learning that contains **5 stages** and they are the following:

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

Stage 1 - Core Programming Fundamentals

Module 1	Module 2	Module 3	Integrated Capability Test(ICT)
• HTML/CSS, JavaScript • Behavioral Skills	• ANSI SQL Using SQL Server • Behavioral Skills	• C# • ADO .NET • Behavioral Skills	• Solve Challenges using combination of all skills in Stage 1

Stage 2 - Deep Learnings

Module 1	Module 2	Module 3	Integrated Capability Test(ICT)
• SQL Server • Behavioral skills	• Entity framework • Behavioral skills	• ASP.Net MVC with Entity Framework • Behavioral skills	• Solve challenges using Combination of all skills in Stage 2

Stage 3 – FSE Module

Module 1	Module 2	Module 3	Module 4
• NUnit, • C# - Additional topics	• ASP.Net Core	• Design Principles and Patterns	• Data Structures and Algorithms

Stage 4 – FSE Module

Module 1	Module 2	Module 3	MFPE
• Bootstrap	• Web Api & Microservices	• Cloud concepts	• Live Project

Stages 1 & 2 would be executed in the **Flipped classroom model** through Learning paths configured on the **Tekstac** platform.

Stages 3 & 4 would be executed with **complete trainer guidance** outside of the Tekstac platform. Software on the local machine will be used to work on the enablement and case study requirements. The modules in this stage would follow a model of **Enablement through Objectives** (not thru Udemy), practice through Hands-on question.

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

There will be a **Final project** thru a case study, **My First Pod Engagement (MFPE)**. This is implemented thru **POD model**. Teams will be identified with 4 or 5 GenCs for the project implementation. **Mentor** will be assigned for every POD to track the project review and completion.

Post Stages 1 to 4, an assessment would be scheduled for **test on Data structures and Algorithms** through **HackerRank**. There would be preparation time for this with a Mock assessment on HackerRank of the same pattern.
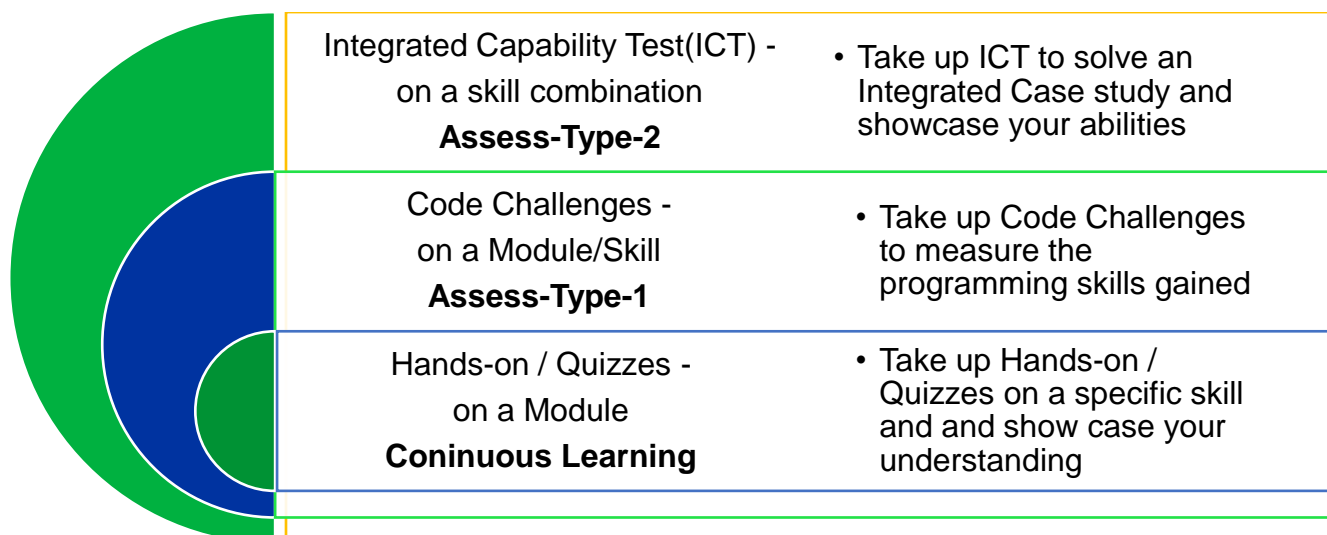
Key Learning Components of the Program

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

You have to score a minimum of 70% in each of the key components.

Integrated Capability Test(ICT) - on a skill combination **Assess-Type-2**	• Take up ICT to solve an Integrated Case study and showcase your abilities
Code Challenges - on a Module/Skill **Assess-Type-1**	• Take up Code Challenges to measure the programming skills gained
Hands-on / Quizzes - on a Module **Coninuous Learning**	• Take up Hands-on / Quizzes on a specific skill and and show case your understanding

Throughout the learning path, all the Mandatory Learning Components will attribute to the Performance Health Score. Additional Learning Components will help you to enhance your expertise level.

Program Completion Criteria

Complete all the mandatory Coding Challenges and ICT with benchmark of 70% in both the stages. Coding challenges will be scheduled on the last day of the Milestone. ICT will be scheduled on the last day of the Stages 1 & 2.

MFPE involves project evaluation on functionality and technical features. Self-evaluation of the project should be done by the GenC, followed by Trainer evaluation. MFPE mentor would conduct a Viva voce on the project implementation and score the GenC code. Mentor can override the trainer's evaluation score if needed. Final MFPE evaluation score should have a benchmark of 70%.

Icebreaker

Icebreaker session will be conducted for a duration of 9 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.

Overall Duration: 5 days

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

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

Day 1

HTML5, CSS3

Learn the basics of HTML5 & CSS3

Learn and Practice:

[Responsive Web Design: HTML5 + CSS3 for Entrepreneurs 2018](#)

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

Mandatory Hands-on (Platform: Tekstac)

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

Additional Hands-on

- Rate Card For Boat Riding

Day 2

JavaScript

Learn the basics of JavaScript

Learn and Practice:

[Javascript basics for beginners](#)

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

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

[Form Validation](#)
- JavaScript Form Validation
- JavaScript can validate numeric input
- Data Validation

[String Methods](#)
- String Length
- The substring() Method
- String.trim()

[JavaScript HTML DOM](#)
- The HTML DOM (Document Object Model)
- What is DOM?
- What is the HTML DOM?

[Window alert() Method](#)
- Definition and Usage
- Example

[JavaScript isNan() Function](#)
- Definition and Usage
- Example

[JavaScript isNan() Function](#)
- Definition and Usage
- Example

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

javascript-coder.com

[JavaScript Form Submit Example](#)
- Refer code example in this web page

Mandatory Hands-on (Platform: Tekstac)

- ACTB Connection Portal
- EMI Calculator

Additional Hands-on

- Fixed And Reducing Interest Loan Estimator

Technical Quizzes:

- Quiz 1, 2

Day 3, 4

Practice Case Study

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

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

- All code challenges

* **Note:** Behavioral session will be conducted on any day in Milestone 1, for 8 hours – based on Trainer Availability. Module covered would be: HeadStart_First Act

Stage 1: Milestone 2

Overall Duration: 3 days

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

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

Day 1

Database design

DDL Commands, DML Commands

Learn and Practice:

[Sql for beginners](#)

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

Mandatory Hands-on (Platform: Tekstac)

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

Additional Hands-on

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

Day 2

Database design

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

Learn and Practice:

[Sql for beginners](#)

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

Mandatory Hands-on (Platform: Tekstac)

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

Additional Hands-on

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

Technical Quizzes:

- Quiz 2 & 3

Day 3

Practice Case Study

- Go through SQL specification of truYum (truYum-sql-specification.pdf)
- Create schema, table and queries for storing and retrieving data for truYum

Assess-Type-1: Code Challenge

- All Code challenges

Stage 1: Milestone 3

Overall Duration: 11 days

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

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

Day 1

C#

Intro, Platform, Syntax, Variables, Keywords, Operators, Methods

Learn and Practice:

[Complete CSharp Master class](#)

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Your First C# Program And Overview Of Visual Studio
  - DataTypes And Variables
  - Functions / Methods And How To Save Time
- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- Find Square and Cube
- Registration Form
- BooleanResult

Additional Hands-on

- MaxValueofSignedByte

Day 2

C#

Conditional statement, Loops, class, object

Learn and Practice:

[Complete CSharp Master class](#)

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Making Decisions
    - Loops
    - Object Oriented Programming (OOP)
- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- StringConcatenate
- Generate Bill Details

Additional Hands-on

- MultiplicationTablesChart

Day 3

C#

Encapsulation, Inheritance, Interface

Learn and Practice:

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Inheritance And More About OOP
    - Polymorphism And Even More On OOP + Text Files
- Implement the examples along with the author.

Additional Learning

- OOAD Workshop

Mandatory Hands-on (Platform: Tekstac)

- AccountDetails
- OpenableInterface
- GameInheritance
- MaxValueofSignedByte

Additional Hands-on

- User Details
- Copy File Contents
- Bank Information - FileWrite

Day 4

C#

Arrays and Lists, Debugging

Learn and Practice:

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Arrays & Lists
    - Debugging
- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- Quiz Competition Report
  Reverse a Sentence

Technical Quizzes:

- Quiz 1

Day 5

C#

Access modifiers, Abstract class, DateTime object, Structs, Enum, Delegates, Events, LINQ, Lambda, Anonymous function, XML

Learn and Practice:

[Complete CSharp Master class](#)

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Advanced C# Topics
  - Events and Delegates
  - Linq
- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- Flight Status
- Age Calculation
- Vehicles Released in Certain Years – Linq
- Product details
- CalculatorProgram
- Extract Book Code - Hands –On
- AddNewMember - Hands- On
- Balls Bowled - Hands-On
- Find the Age of a person

Day 6

ADO.Net

Go through the PDF document ADO.Net_Learning.pdf. Refer page numbers 1 to 21, 25 to 28

Mandatory Hands-on (Platform: Tekstac)

- ADO.NET_WorkshopEnrollmentApp_HandsOn1
- Seminar Ticket Booking

Day 7, 8

Practice Case Study

- TruYum Practice Case Study on C# – To be done using Visual studio & SQL Server management studio

Day 9

Asses-Type-1: Code challenge

- All code challenges

Day 10

Integrated Capability Test (ICT) (Platform: Tekstac)

- Mock ICT
- ICT

* Note: Behavioral session will be conducted on any day in Milestone 3, for 8 hours – based on Trainer Availability. Module covered would be:
- Learning agility
- Tools to Problem Solving, Critical thinking, open to change & learn & Memory Hacks
- Professional Etiquette + Context setting
- Professional Etiquette coaching

Stage 2: Milestone 1

Overall duration: 3 days

Milestone 1 will be focusing on MS SQL Server.
Udemy learnings are recommended in the Platform to understand the fundamental concepts.
Apply the concepts learned and solve the Hands-on as recommended below.

MS SQL Server

Table creation, CRUD Operations with Data Integrity, Constraints

Learn and Practice:

[70-461, 761: Querying Microsoft SQL Server with Transact-SQL](#)

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Section 1: Session 1 - Let's begin, and let's download SQL Server
  - Section 2: Session 1 - Starting SQL Server
  - Section 3: Session 1 - Creating tables - First pass
  - Section 15: Session 3 - Create and modify constraints
- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- Create table with Foreign Key constraint
- Alter Supplier table with Check Constraint

MS SQL Server

Subqueries and Joins

Learn and Practice:

[70-461, 761: Querying Microsoft SQL Server with Transact-SQL](#)

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Section 11: Session 2 - Adding a second table
  - Section 12: Session 2 - Find missing data, delete and update data
  - Section 32: Session 6 - Sub-queries

- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- Worker and Admin Departments
- Employee with reporting manger
- Employees working in New York

Day 3

MS SQL Server

Functions, Stored Procedures

Learn and Practice:

[70-461, 761: Querying Microsoft SQL Server with Transact-SQL](#)

- Learn the sections listed below in this Udemy course and complete the corresponding hands-on coding given below.

    o Section 5: Session 1 - String data types and functions
    o Section 6: Session 1 - Date data types and functions
    o Section 10: Session 2 - Summarising and ordering data
    o Section 21: Session 4 - Objective 11 - Create and alter stored procedure
    o Section 36: Session 6 - Objective 14: Functions

- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- Procedure to display the Employees of a specific Department
- Procedure to display all the Departments

Technical Practice Case Study

- truYum Practice Case Study – To be done using SQL Server management studio

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

- Code challenge

Stage 2: Milestone 2

Overall duration: 5 days

Milestone 2 will be focusing on **Agile** basics and **Entity Framework** along with behavioral skills*

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

Day 1

Agile Basics

Learn and Practice:

[Agile crash course](#)

- All sections in this course

Entity Framework

Introduction to Entity Framework, Building model with Database & Code first Approach

Learn and Practice:

[Entity Framework in Depth: The Complete Guide](#)

- Learn sections listed below in this Udemy course and complete the corresponding hands-on coding given below
    - Introduction
    - Getting Started
    - Building a Model using Database-First Workflow
    - Building a Model using Code-First Workflow
- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- StudentDetails Using CodeFirst

Day 2

Entity Framework

Building model Code first Approach, Fluent Api, Querying data using LINQ

Learn and Practice:

[Entity Framework in Depth: The Complete Guide](#)

- Learn sections listed below in this Udemy course and complete the corresponding hands-on coding given below
  - Overriding Code-First Conventions
  - Querying Data using LINQ
  - Loading Related Objects
  - Updating Data
- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- BookEntry_FluentAPI

Day 3

Entity Framework

Entity Framework Repository pattern

Learn and Practice:

[Entity Framework in Depth: The Complete Guide](#)

- Learn sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Updating Data
  - Using Entity Framework in Your Applications
- Implement the examples along with the author.

Mandatory Hands-on (Platform: Tekstac)

- Course Repository

Entity Framework

Learn and Practice:

[Entity Framework in Depth: The Complete Guide](#)

- Learn sections listed below in this Udemy course.
    - Getting Started
    - Building a Model using Database-First Workflow
    - Using Entity Framework in Your Applications
- Implement the examples along with the author.

Technical Quizzes (Platform: Tekstac)

- Quiz 1

* Note: Behavioral session will be conducted on any day in Milestone 2, for 8 hours – based on Trainer Availability. Below would be the modules covered:

- Business Communication 1
- Business Communication 2

Stage 2: Milestone 3

Overall duration: 8 days

Milestone 3 will be focusing on ASP.Net MVC with Entity Framework

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

ASP.Net MVC

ASP.Net MVC Basics – Controllers and Actions, Data transfer

Learn and Practice:

[The Complete ASP.NET MVC 5 Course](#)

- Learn sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
    - Getting Started
    - ASP.NET MVC Fundamentals

Mandatory Hands-on (Platform: Tekstac)

- Ex 1.1 - Controllers and Actions
- Ex 1.2 Controllers and Actions
- Ex 2.1 - Working With View Bag

Day 2

ASP.Net MVC

ASP.Net MVC Basics – data binding to UI & reusable content

Learn and Practice:

[The Complete ASP.NET MVC 5 Course](#)

- Learn sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - ASP.NET MVC Fundamentals
  - Building Forms
  - Implementing Validation

Additional learning:

Please go thru the [additional learning](#) on partial view

Mandatory Hands-on (Platform: Tekstac)

- Ex 3.1 Working With Model Binding
- Ex 3.2 Working With Model Binding
- Ex 5-1 Partial View

Day 3

ASP.Net MVC

ASP.Net MVC Basics – Action Verbs and Selectors, Entity Framework integration

Learn and Practice:

[The Complete ASP.NET MVC 5 Course](#)

- Learn sections listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Working with Data
  - Building Forms

Additional learning:

Please go thru the [additional learning](#) on Action Verbs

Mandatory Hands-on (Platform: Tekstac)

- Ex 4-1 Working With HTTP POST
- Ex 4-2 Working With HTTP POST
- Ex 6-1 Entity Framework Integration With ASP MVC

Day 4

ASP.Net MVC

ASP.Net MVC Basics – Entity Framework integration

Learning reference:

[The Complete ASP.NET MVC 5 Course](#)
- Refer section listed below in this Udemy course and complete the corresponding hands-on coding given below.
  - Working with Data

Mandatory Hands-on (Platform: Tekstac)

- Ex 6-2 Entity Framework Integration With ASP MVC
- Ex 6-3 Entity Framework Integration With ASP MVC - POST
- Ex 6-4 Entity Framework Integration With ASP – POST

Day 5

Technical Quizzes (Platform: Tekstac)

- Quiz 1

Technical Practice Case Study

- truYum Practice Case Study

Day 6

Technical Practice Case Study

- TruYum Practice Case Study

Day 7

Technical Practice Case Study

- TruYum Practice Case Study

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

- Code challenge

Day 8

Assess-Type-2: Integrated Capability Test (ICT) (Platform: Tekstac)

- Mock ICT
- ICT

Stage 3 – .NET Advanced Features

Overall duration: 11 days

This module will be focusing on the unit testing aspects as well as ASP.NET Core which is a free and open-source web framework and successor to ASP.NET, developed by Microsoft.

Day 1

NUnit

Introduction, Assertions, Constraints and Attributes, Running Test

Learning reference:

genc-NUnit-Objectives_FSE

- Refer the objectives with session Id NUnit-01 & NUnit-02

Hands-On:

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

Day 2 - Forenoon

Mocking Framework (Moq)

Mocking Framework using Moq

Learning reference:

genc-NUnit-Objectives_FSE

- Refer the objectives with Topic Id Moq-01

External Reference Link

NUnit & Moq

- Walkthrough the content in the above link and try it out the demo given in there for better understanding and gaining confidence on the subject.

Hands-On:
- Hands On 1

Day 2 - Afternoon

C# Additional Topics

Async Programming, Multithreading

Learning reference:

genc-C#4.5-objectives_FSE

- Refer the objectives with session Id C#4.5-T01 & C#4.5-T02

Hands-On:

- Hands On 1
- Hands On 2

Day 3 - Forenoon

C# Additional Topics

Other Application Types- Windows Forms, Windows Service

Learning reference:

[Introduction to Windows Service Applications](#)

- Navigate to other sections like **Service Application Programming Architecture** and **How to: Create Windows Services** from the left pane of the web page.

[Getting Started with Windows Forms](#)

- Navigate to other sections like **Windows Forms Overview** and **Windows Forms Controls** from the left pane of the web page.

Hands-On:

- [Hands On 1](#)

Day 3 - Afternoon

Code Analysis

Learning reference:

[Overview of code analysis for .NET in Visual Studio](#)

- Walkthrough the above link to get started with the Code Analysis of managed code

[Code analysis rule set reference](#)

- Take a look at the list of built-in rule sets.

Hands-On:

- [Hands On 1](#)

Day 4

ASP.NET Core

Benefits of .Net Core, .Net Core components and its importance

Learning reference:

[genc-Core-objectives_FSE - V3](#)

- Refer the objectives with Topic Id Core-T01 & Core-T02

Hands-On:

- [Hands On 1](#)

Day 5

ASP.NET Core

MVC components in Web page rendering, Data binding concepts in .Net core

Learning reference:

[genc-Core-objectives_FSE - V3](#)

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

Hands-On:

- [Hands On 1](#)

Day 6

ASP.NET Core

Exception filter, Simple usage of Entity Framework

Learning reference:

[genc-Core-objectives_FSE - V3](#)

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

Hands-On:

- [Hands On 1](#)

Day 7

ASP.NET Core

Knowledge on using log4net for logging

Learning reference:

[genc-Core-objectives_FSE - V3](#)

- Refer the objectives with Topic Id Core-T04

Hands-On:

- [Hands On 1](#)

Day 8 , 9

Practice Check:

- [Generic medicine application](#)

Day 10, 11

Final Check:

- [Food supply application](#)

Stage 3 – Design Principles and Patterns

Overall duration: 5 days

This module will be focused on design patterns and principles that help the developers to make a good system design. Design patterns provide solutions to common problems, occur in the software design.

Day 1

SOLID principles

SOLID principles, Need and benefits of Design patterns

Learning reference:

[genc-DesignPrinciples-objectives](#)

- Refer the objectives with session Id DP-T01

Hands-On:

- [Day 1 – Hands On 1](#)

Day 2

Types of Design Patterns

Design Patterns – Creational and Structural

Learning reference:

[genc-DesignPrinciples-objectives](#)

- Refer the objectives with session Id DP-T02
- Refer the objectives with session Id DP-T03

Hands-On:

- [Day 1 – Hands On 1](#)
- [Day 2 – Hands On 2](#)

Day 3

Types of Design Patterns

Design Patterns – Behavioral design patterns

Learning reference:

[genc-DesignPrinciples-objectives](#)

- Refer the objectives with session Id DP-T04, T05 & DP-T06

Hands-On:

- [Day 2 – Hands On 1](#)
- [Day 2 – Hands On 2](#)
- [Day 2 – Hands On 3](#)

Day 4

Practice Check:

- [Practice Check Case study on Design Principles](#)

Day 5

Final Check:

- [Final Check Case Study on Design Principles](#)

Stage 3 - Data Structures and Algorithms

Overall duration: 4 days

This module deals with Data Structures and Algorithms that are an integral part of a computer program.

Data Structures determine memory organization principles of data which help in efficient storage of data in storage device

Algorithm is a step-wise representation of a solution to a given problem, which makes it easy to understand and is not dependent on any programming language.

Day 1

Data Structure

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

Learning reference:

[Algorithms and Data Structures in C#: Complete Tutorial](#)

- Refer section listed below in this Udemy course and follow the instructor for guided hands on.

  o Section 2: Introduction to Algorithms and Data Structures
      3. Intro to Data Structures
  o Section 4: Arrays
  o Section 6: Lists
  o Section 7: Stacks
  o Section 8: Queues

Hands-On:

- [Hands On 1](#)
- [Hands On 2](#)
- [Hands On 3](#)
- [Hands On 4](#)
- [Hands On 5](#)

Day 2

Data Structure

Non-Linear Data Structure- Trees, Graphs

Learning reference:

[Algorithms and Data Structures in C#: Complete Tutorial](#)

- Refer section listed below in this Udemy course and follow the instructor for guided hands on.

  o Section 12: Trees

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

- [Graph Data Structure](#)
- [Heap Data Structure](#)
- [Hash Data Structure](#)

Hands-On:

- [Hand On 1](#)
- [Hand On 2](#)
- [Hand On 3](#)
- [Hand On 4](#)
- [Hand On 5](#)

Day 3

Algorithm

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

Learning reference:

[Algorithms and Data Structures in C#: Complete Tutorial](#)

- Refer section listed below in this Udemy course and follow the instructor for guided hands on.

    - Section 2: Introduction to Algorithms and Data Structures
        - ❖ 4. Intro to Algorithms
    - Section 3: Introduction to Algorithm Analysis
        - ❖ 5. Time Complexity
        - ❖ 8. Order of Growth
    - Section 5: Sorting Algorithms
    - Section 9: Search Algorithms

Hands-On:

- [Hands On 1](#)
- [Hands On 2](#)
- [Hands On 3](#)
- [Hands On 4](#)
- [Hands On 5](#)

Day 4- Forenoon

Practice Check:

- Hackerrank assessment – Practice

Day 4- Afternoon

Final Check:

- Hackerrank assessment - Final

Stage 4 - Bootstrap

Overall duration: 2 days

This module deals with topics on **Responsive Web Design (RWD) using Bootstrap,** a styling framework. This can be done using Notepad++ or Visual studio

Day 1

Bootstrap

Bootstrap – Fundamentals, Grid System, NAV Bar

Learning reference:

genc-web-ui-rwd-objectives

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

Hands-On:

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

Day 2

Bootstrap

Bootstrap – Chrome DevTools, Components, Styles

Learning reference:

[genc-web-ui-rwd-objectives](#)

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

Hands-On:

- [Day 2 - Session 1](#)
- [Day 2 – Session 2](#)

Stage 4 – ASP.NET Core Web API

Overall duration: 7 days

This module deals with **ASP.NET Core** which helps in creating **RESTful** services, also known as web APIs.

Day 1

Web API

Web API – REST Concepts

Learning reference:

[genc-WebAPI-objectives_FSE](#)

- Refer the objectives with session Id WebAPI-T01

Hands-On:

- [Web API Hands-On 1](#)

Day 2

Web API

Web API – Tools, Attributes

Learning reference:

[genc-WebAPI-objectives_FSE](#)

- Refer the objectives with session Id WebAPI-T02 & WebAPI-T03

Hands-On:

- [Web API Hands-On 1](#)
- [Web API Hands-On 2](#)
- [Web API Hands-On 3](#)

Day 3

Web API

Web API – Tools, Attributes

Learning reference:

[genc-WebAPI-objectives_FSE](#)

- Refer the objectives with session Id WebAPI-T04, WebAPI-T05, WebAPI-T06 & WebAPI-T07

Hands-On:

- [Web API Hands-On 1](#)
- [Web API Hands-On 2](#)

Day 4,5

Practice Check:

- [Practice Check Case Study on Web API](#)

Day 6,7

Final Check:

- [Final Check Case Study on Web API](#)

Stage 4 – Cloud Concept

Overall duration: 10 days

This module deals with **Microsoft Azure** which is a cloud computing service created by Microsoft for building, testing, deploying, and managing applications and services through Microsoft-managed data centers.

Day 1

Introduction to Cloud Computing

Cloud Concept - Azure

Learning reference:
genc-DevOps-Cloud -objectives_FSE - V4

- Refer the objectives with Topic Id **Cloud-T01, Cloud-T02**

Hands-On:

- Hands On 1

Day 2-Forenoon

Application Insights

Cloud Concept – Azure Application Insights

Learning reference:
genc-DevOps-Cloud -objectives_FSE - V4

- Refer the objectives with Topic Id **Cloud-T03**

Hands-On:

- Hans On 1

Day 2-Afternoon

DevOps-CI/CD

Cloud Concept – DevOps-CI/CD

Learning reference:

genc-DevOps-Cloud -objectives_FSE

- Refer the objectives with Topic Id Cloud-T04

Hands-On:

- Hands On 1

Day 3

DevOps-CI/CD

Learning reference:

genc-DevOps-Cloud -objectives_FSE

- Refer the objectives with Topic Id Cloud-T05

Hands-On:

- Hands On 1

Day 4

Container Basics – Docker

Docker is used to build modules called **Microservices**, which decentralize packages and divide tasks into separate, stand-alone apps that collaborate with each other.

Cloud Concepts- Docker

Learning reference:

genc-DevOps-Cloud -objectives_FSE

- Refer the objectives with Topic Id **Cloud-T06**

Day 5

Container Basics – Kubernetes

Kubernetes is an open-source container-orchestration system for automating computer application deployment, scaling, and management.

Cloud Concepts- Kubernetes

Learning reference:

genc-DevOps-Cloud -objectives_FSE

- Refer the objectives with Topic Id **Cloud-T07**

Day 6

Cloud deployment

Learning reference:

genc-DevOps-Cloud -objectives_FSE

- Refer the objectives with Topic Id **Cloud-T08** & **Cloud-T09**

Hands-On:

- Hands On 1

Day 7

Cloud deployment

Learning reference:

genc-DevOps-Cloud -objectives_FSE

- Refer the objectives with Topic Id **Cloud-T10**, **Cloud-T11** & **Cloud-T12**

Hands-On:

- [Hands On 1](#)
- [Hands On 2](#)
- [Hands On 3](#)
- [Hands On 4](#)

Day 8,9,10

Practice Check:

- [Practice Check Case Study on Cloud Concept](#)

Stage 4- My First POD Engagement (MFPE)

Overall duration: 10 days

Every GenC will undergo MFPE towards the end of their learning journey. This will help them to apply the skills acquired on a business case study while being in Agile POD team.

Mentors will guide them throughout in this two weeks engagement. They also evaluate their coding standards and problem solving skills during their mentorship.

How to learn each day?

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

The below strategies will help you decide the learning approach.

Learning Strategy & Approach

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

Profile #1

Harry Reacher
Engineering Discipline: Electronics
Skills: Python, Ruby on Rails, nginx

Project: Mining Crime Data to get Route Cause Insights

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

What will work for me?

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

Profile #2

Olivia Richards

Engineering Discipline: Computer Science

Skills: Java, C, C++

Project: Library Management System

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

What will work for me?

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

Profile #3

Greg Anderson

Engineering Discipline: Civil

Skills: C

Project: Fiber reinforced concrete

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

What will work for me?

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

1. **Who can participate in this program?**

    A. Students who have enrolled for Full Internship can participate in this program.

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

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

3. **What is the significance of Hands-on in the overall learning journey?**

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

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

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

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

    A. Coach is your point of contact.

6. **Is there Code Challenge and ICT for Stage 3?**

    A. No, since it is not executed on Tekstac platform