

HL7 FHIR Training

Course Aims

This course is for FHIR programmers, interface developers and dedicated Implementers and is designed to provide the skills for the analysis testing, problem tracking and activation of phases of a FHIR project. Attendees will learn FHIR design, message formatting rules, data types, enhanced acknowledgement rules, identifiers. Coursework includes hands-on exercises.

On completion of this course, attendees will have gained a deep understanding of FHIR standard processes and practices, with the ability to effectively read, understand, analyse, design, develop, market and test FHIR resources.

We will also have some quizzes in between to make sessions more interactive.

➤ Server Requirements

- Server/System that can access FHIR HAPI server
- Postman/Insomnia
- SmartHL7 viewer
- Access to clinFHIR
- SQL server
- Mirth Connect
- Java – 1.8
- Notepad++
- VSCode

➤ Required Basic knowledge

- Nothing specific, basic knowledge about RESTAPI's and JSON

Session – Introduction to FHIR – 1 hour

Objective

This session will give an understanding of why FHIR is used in healthcare and the goals that are achieved.

- Hospital Workflow
- Purpose of FHIR
- Use case scenario to solve problem
- FHIR Material overview
- Patient resource structure – Basic (very high Level)
- JSON Format
 - Elements/Properties
 - Single Value assignments Vs Object assignments
 - Array assignments

Session – FHIR Resources In-depth – 4 hours

Objective

These sessions give an understanding of what FHIR is and its concepts. It introduces Resources and then goes into the building of FHIR messages and the elements involved in the object construction. It goes into detail of the structure. We will have **hands-on using VSCode to create a resource**

- Resources – Patient Resource
 - Understanding Resource structure
 - Cardinality
 - Data Types
 - Identifier
 - Human Name
 - Date/DateTime
 - Integer
 - Boolean
 - Backbone element
 - Code
 - Codeable Concept
 - Descriptions
 - Table codes for Code and Codeable concepts table data
 - Ancestor resources
 - Base Resource
 - Resource Identity and Elements involved
 - Domain Resource and its contents
 - Narrative and Discrete sections explanation
 - Constructing a resource in Notepad++
 - Updating a resource using Schema reference (VS Code)
 - Searching for Resources – Basic
 - FHIR Maturity levels

Session – REST Services and other Paradigms of FHIR - 4 hours

Objective

These sessions details of how we use REST services in REST paradigm of FHIR. We will have **hands-on using Postman/Insomnia** and interacting with HAPI FHIR server

- Client Server architecture
- REST Services – Introduction to REST
- REST Services in Action
- Basic REST Principles and URL Structure
- What is an API?
- Interactions in FHIR - CRUD Operations
 - Instance Level
 - Type Level
 - Whole System Level
- Searches

Session – Other Resource structure, Resource References and Workflows – 2 hours

Objective

These sessions details of other resources and their structure and workflow examples. Will have **hands-on using ClinFHIR (Check the cert cheat sheet to talk about workflow modules)**

- Practitioner
- Organization
- Appointment resource
- Encounter Resource
- Service Request
- Observation
- Diagnostic report
- Medication Request
- Workflow Modules
- Resource Life cycles

Session – Special Resources/Concepts/Searches – 3 hours

Objective

These sessions details of other special resources and their structure and workflow examples. **Hands-on using Postman/Insomnia**

- Bundled Resources
 - Posting Multiple resources
 - Additional Operation
 - Conditional Create/Update while posting multiple resource.
 - Usage of Temp Place holder UUID
- Contained Resources
- Advanced Search
 - Sort
 - Content
 - Count
 - Date
 - Elements
 - Include
 - Rev include
 - Chaining
- Extensibility
 - Simple extensions
 - Complex extensions
 - Steps to create an Extension

Session – Mirth and V2 to FHIR Conversions – 4 hours

Objective

These sessions are to understand how to use an Interface Engine like Mirth Connect to convert HL7 V2 messages to FHIR and post them. **Hands-on using Mirth Connect**

- Filters and Transformers
- Conversion of HL7 V2 to FHIR and posting to HAPI server

Session – Security – 2 hours

- Security protocols overview
 - SSL certificates and their workflow
 - Basic Authentication
- OAuth 2.0
 - OAuth 2.0 Terminology
 - Resource Owner
 - Client
 - Authorization Server
 - Resource Server
 - Authorization grant
 - Redirect URI
 - Access Token
- SMART on FHIR
 - Concept of Smart on FHIR
 - Workflows using SMART on FHIR

Session – Conformance and Profiling – 2 hours

Objective

These sessions details about conformance related topics and profile building concepts

- Profiling and its concepts
- Capability statement
- Structure Definition
- Implementation guide
- Interpreting flags and Icons
- Licensing

Session – Terminology – 3 hours

Objective

This session details of the concepts of Terminology overview and how to use public servers

- Understanding the usage of Terminologies
- Code system
- Value sets

Session – Preparation for certification – 1 hour

Objective

These sessions details on topics that you must go through to complete your certification.

- Overview of the exam
- Weightage for individual topics
- Sample questions