**INTEGRATION and API Development Using MULESOFT (run-time engine of Anypoint Studio)**

This study is mainly for learning the development side of Anypoint Platform to build APIs and integrations. In the first part, Anypoint Platform is used to discover, consume, design, build, deploy, manage and govern APIs. In later parts, the focus is on using Mule and Anypoint Studio to build applications for use as API implementations and integrations.

Week 1: Introducing API-Led Connectivity

- Identify the problems faced by IT today
- Describe what API-led connectivity is and its benefits
- Explain what web services and APIs are
- Explore API directories and portals
- Make calls to secure and unsecured APIs
- Introduce API-led connectivity with Anypoint Platform
- Explore Anypoint Platform

Week 2: Designing APIs

- Define an API with RAML, the Restful API Modeling Language
- Mock an API to test its design before it is built
- Create a portal for developers to learn how to use an API
- Make an API discoverable by adding it to the private Exchange

Week 3: Building APIs

- Introduce Mule applications, flows, messages, and message processors
- Use Anypoint Studio to create a flow graphically
- Build, run, and test a Mule application
- Use a connector to connect to a database
- Use the graphical DataWeave editor to transform data
- Create a RESTful interface for an application from a RAML file
- Connect an API interface to the implementation

Week 4: Deploying and Managing APIs

- Describe the options for deploying Mule applications
- Use properties in Mule application to the cloud
- Create and deploy a proxy for an API in the cloud
- Restrict access to an API proxy

Week 5: Accessing and Modifying Mule Messages

- Log message data
- Debug Mule applications
- Read and write message properties
- Write expressions with Mule Expression Language (MEL)
- Create variables

Week 6: Structuring Mule Applications

- Create and reference flows and subflows
- Pass messages between flows using the Java Virtual Machine(VM) transport
- Investigate variable persistence through subflows and flows and across transport barriers
- Encapsulate global elements in separate configuration files
- Explore the files and folder structure of a Mule project

Week 7: Consuming Web Services

- Consume RESTful web services with and without parameters
- Consume RESTful web services that have RAML definitions
- Consume SOAP web services
- Use DataWeave to pass parameters to SOAP web services

Week 8: Handling Errors

- Describe the different types of exception strategies
- Handle messaging exceptions in flows
- Create and use global exception handlers
- Specify a global default exception strategy

Week 9: Controlling Message Flow

- Route messages based on conditions
- Multicast messages
- Filter messages
- Validate messages

Week 10: Writing DataWeave Transformations

- Write DataWeave expressions for basic XML, JSON, and Java transformations
- Store DataWeave transformations in external files
- Write DataWeave transformations for complex data structures with repeated elements
- Coerce and format strings, numbers, and dates
- Use DataWeave operators
- Define and Use custom data types
- Call MEL functions and Mule flows from DataWeave transformations

Week 11: Connecting to Additional Resources

- Connect to Saas applications
- Connect to files
- Poll resources
- Connect to JMS queues
- Discover and install connectors not bundled with Anypoint Studio

Week 12: Processing Records

- Use the For Each scope to process items in a collection individually
- Use the batch job element (EE) to process individual records
- Trigger a batch job using poll
- Use a batch job to synchronize data from a legacy database to a SaaS application