

# Developing Applications Using Cisco Core Platforms and APIs(DEVCOR)

**Course Duration: 40 Hours**

**Course code: DEVCOR**

## 1. Course Overview

The Developing Applications Using Cisco Core Platforms and APIs (DEVCOR) course helps you prepare for the Cisco DevNet Professional certification and for professional-level network automation engineer roles. The focus of this course is the implementation of network applications using Cisco® platforms as a base, from initial software design to diverse system integration, as well as testing and deployment automation. The course gives you hands-on experience solving real world problems using Cisco Application Programming Interfaces (APIs) and modern development tools.

## 2. What you'll learn?

**After completing this course you should be able to:**

- Describe the architectural traits and patterns that improve application maintainability
- Describe the architectural traits and patterns that improve application serviceability
- Identify steps to design and build a ChatOps application
- Implement robust Representational State Transfer (REST) API integrations with network error handling, pagination, and error flow control
- Describe the necessary steps for securing user and system data in applications
- Describe the necessary steps for securing applications
- Identify common tasks in automated application release process
- Describe best practices for application deployment

- Describe methodologies for designing distributed systems
- Describe the concepts of infrastructure configuration management and device automation
- Utilize Yet Another Next Generation (YANG) data models to describe network configurations and telemetry
- Compare various relational and nonrelational database types and how to select the appropriate type based on requirements

### 3. Target Audience

Existing network engineers expanding their skillbase to include software and automation; Developers expanding their expertise in automation and DevOps; Solution Architects moving to the Cisco ecosystem and Infrastructure developers designing hardened production environments.

### 4. Pre-Requisites

**Attendees should meet the following prerequisites:**

- Knowledge of program design and coding with focus on Python
- Familiarity with Ethernet, TCP/IP, and Internet-related networking
- Understand the utilization of APIs
- Understanding of software development and design methodologies
- Hands-on experience with a programming language (specifically Python)

### 5. Course content

#### 1- Designing for Maintainability

- Functional and Non-Functional Requirements
- Non-Functional Requirements and Application Quality
- Maintainability Through Design
- Maintainability Through Implementation
- Modularity in Application Design

- Dependency Injection

## **2- Designing for Serviceability**

- Observability in Application Design
- Scalability in Application Design
- High Availability and Resiliency
- Latency and Rate Limiting
- Architectural Patterns
- Sequence Diagrams

## **3- Implementing ChatOps Application**

- Introducing ChatOps
- ChatOps with Cisco Webex
- API Sequence Diagramming
- ChatOps Application Design
- Managing SSIDs and Retrieving Location Data Using Cisco Meraki API
- Describing Advanced REST API Integration

## **4- Consuming Paginated REST API Endpoints**

- REST API Network Error Strategies
- REST API Error Control Flow
- Optimizing API Usage

## **5- Securing Application Data**

- Data Storage and Protecting Data Privacy
- Storing Application Secrets
- Public Key Infrastructure
- Configuring Public Key Certificates for Applications
- Applying End-to-End Encryption for APIs

## **6- Securing Web and Mobile Applications**

- OWASP Top 10
- Broken Access Control
- Injection Attacks and Data Validation
- XSS and Request Forgery

- OAuth Authorization Framework
- OAuth 2.0 Three-Legged Authorization Flow

## **7- Automating Application-Release**

- Release Packaging and Dependency Management
- Advanced Version Control with Git
- Branching Strategies
- Continuous Testing and Static Code Analysis in CI Pipeline
- Identifying CI/CD Pipeline Failures

## **8- Deploying Applications**

- 12-Factor App Methodology
- Containerizing Applications Using Docker
- Kubernetes Introduction
- Integrating Applications into Existing CI/CD Environment
- Downloadable Lab Code Reference - Integrate Application into Existing CI/CD Environment
- Hosting Applications on Network Devices

## **9- Exploring Distributed Systems**

- Distributed Application Concepts
- Custom Dashboard Example
- Event-Driven Architecture Concepts
- Microservice Architecture Concepts
- Effective Distributed Application Logging Strategies
- Using Distributed Logging to Diagnose Problems
- Application Monitoring with Cisco AppDynamics
- Limitations of Distributed Systems and CAP Theorem
- Overcoming Challenges in Distributed Systems

## **10- Orchestrating Network and Infrastructure**

- Differentiating Configuration Management Solutions
- Terraform Introduction
- Operating Terraform Fundamentals

- Case Study: Deploying Basic Network Configuration to Cisco Routers
- Configuring Network Parameters Using Ansible
- Defining Network Automation Source of Truth
- Creating and Deleting Objects Using Firepower Threat Defense API
- Configuring Servers Using Cisco UCS APIs

## **11- Modeling Data with YANG**

- YANG Overview
- XPath Query Language
- YANG Language Syntax
- Data Model Modularity
- Network Configuration Using RESTCONF
- Model-Driven Telemetry
- Streaming Telemetry with gNMI

## **12- Using Relational and Non-Relational Databases**

- Evaluating Database Types to Meet Application Needs
- Relational Database Concepts
- Key-Value Database Concepts
- Document-Based Database Concepts
- Graph-Based Database Concepts
- Columnar-Based Database Concepts
- Time-Series Database Concepts