

	DevOps	L	T	P	C
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Pre-requisites/Exposure	Basic Knowledge Linux operating system				
Co-requisites					

Course Objectives

The objective of this course are

1. To learn fundamental of DevOps.
2. To get the knowledge of DevOps applications.
3. To learn DevOps principles, lifecycles and tools.
4. To know testing, deployment, monitoring, issue tracking and workflow for DevOps based solutions.

Course Outcomes

On completion of this course, the students will be able to

- C01. Explain the DevOps fundamentals and business applications.
- C02. Apply the DevOps tools for real world problem solving.
- C03. Apply the high-throughput and data intensive applications programming.
- C04. Apply testing, deployment, monitoring, issue tracking and workflow for DevOps based solutions.

Catalog Description

This course is designed with an aim to provide the knowledge in DevOps, the open source framework that reduces the gap between software engineers and operations. It provides details in continuous delivery, agile development, configuration management, automation, fast deployment, or team collaboration etc. and use using various DevOps tools.

Course Outline

UNIT 1: Introduction to DevOps

7 hours

Definition of DevOps: Challenges of traditional IT systems & processes, History and emergence, of DevOps, DevOps definition and principles governing DevOps, DevOps and Agile, The need for building a business use case for DevOps, Purpose of DevOps, Application Deployment, Automated Application Deployment, Application Release Automation (ARA), Components of Application Release Automation (ARA), Continuous Integration, Best Practices of CI, Benefits of CI, Continuous Delivery, Proces

Unit 2: Typical Toolkit for DevOps

7 hours

DevOps: An Overview, Achieving DevOps, Continuous Practices, Continuous Integration (CI), How does CI Work?, Continuous Integration Practices, Benefits of Continuous Integration A Quick Recap of Continuous Delivery, Continuous Delivery Process, Benefits of Continuous Delivery, Continuous

Deployment, Introduction to CI, Continuous Integration Workflow, Benefits of Continuous Integration, How CI Benefits Distributed Teams, Continuous Delivery, Steps Involved in CI/CD, Pipelines, Prerequisites, Checklist, Business Drivers for Continuous Deployment, Benefits of Continuous Deployment, Simple Delivery Pipeline, Continuous Deployment Pipeline, Releasing an application to Production, Zero-Downtime Releases, Rolling back deployments, Blue-Green Deployments, Canary Releasing, Emergency Fixes, Continuous Delivery engineering practices, Continuous Development/Integration

UNIT 3: Source Code Management

8 hours

History of Version Control Systems (VCS), Basic operations in a VCS, Examples of version control systems, Subversion (SVN), Features and Limitations, Mercurial, Git, Overview, History - Linux and Git by Linus Torvalds, Advantages of Git, Explain how local version control works, Centralized Version Control Systems (CVCS), Distributed Version Control Systems (DVCS), advantages of DVCS, Private Workspace

Unit 4: Application Containerization

7 hours

Understanding Containers: Transporting Goods Analogy, Problems in Shipping Industry, before Containers, Shipping Industry Challenges, Container: Virtualization Introduction, Hypervisor, Scope of Virtualisation, Containers vs Virtual Machines, Understanding Containers, Containerisation Platform, Runtime and Images, Container Platform, Container Runtime, The Chroot System, FreeBSD Jails, Linux

Containers (LXC), Docker

UNIT 5: Introduction to Containerization

7 hours

Docker architecture, Docker Daemon (Container Platform), Docker Rest API , CLIDifferent, environments: (Dev, QA and Prod), Overcoming issues with different environments, Development Environment Docker Swarm and Kubernetes, Architecture, AWS (ECS,EKS), AWS Elastic Container Services Architecture, Azure Kubernetes Services, Openshift, KUBERNETES ON CLOUD, Monitoring of container

Text Book

- DevOps (Xebia Content)

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Internal	Mid Term	ESE	Total
Weightage (%)	30%	20%	50%	100%

Relationship between the Course Outcomes (COs), Program Outcomes (POs) and Program Specific Outcomes (PSOs)

Course Outcomes	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02	PS03
CO1	1		2		2						1			2	1
CO2	1	2	2		2						1			2	1
CO3	1		2		2						1			2	1
CO4	1		2		2						1			2	1
Average	1	2	2		2						1			2	1

1=weak

2= moderate

3=strong