



SYMBIOSIS INSTITUTE OF TECHNOLOGY

Symbiosis International (Deemed University)

(Established under section 3 of the UGC Act, 1956)

Founder: Prof. Dr. S. B. Mujumdar, M. Sc., Ph. D. (Awarded Padma Bhushan and Padma Shri by President of India)

Course Name: DevOps
Course Code: TE7951
Faculty: Engineering
Course Credit: 2
Course Level: 4
Sub-Committee (Specialization): Computer Science

Learning Objectives:

1. Understand the benefits of DevOps over other software development processes, gain insights into the DevOps environment, get an overview of different DevOps Tools and Get a picture of the working of the DevOps Delivery Pipeline.
2. Understand Version Control, perform management of files for small as well as large projects, perform various Git commands such as git add, git fetch, git commit, git init, etc. Work with remote repositories
3. Learn and install Selenium, Create Test Cases in Selenium WebDriver, Utilize X-Path and TestNG to locate elements, execute code on several browsers using Selenium suite of tools, and Integrate Selenium with Jenkins.
4. Managing authorization in Jenkins, Jenkins notification management, Master-slave architecture in Jenkins, add a slave node to Jenkins master, Build and deploy codes using Jenkins, build pipeline plugin in Jenkins, and Use Declarative pipeline in Jenkins.
5. Get insight of deployment. Learn characteristics of deployment tools, and use any deployment tools to deploy container.

Pre-requisites:

Python / Powershell / Perl / Java / .net, scripting, cloud technology, software engineering.

Course Outline:

Unit No.	Details	Hours
1	Introduction to DevOps :Introduction, Architecture, Lifecycle, Workflow Principles, DevOps Tools, Concept of Automation, Engineering, Pipeline Methodology, DevOps Vs Agile.	2
2	Continuous Development Code and Build Tools:Version Control Using GIT: Introduction, Features, benefits, GitHub, staging and commits, undoing changes, inspecting changes, branching and merging, collaborating: fetch, pull and push.Building Tools Mavens: Introduction to maven, Architecture, integration, plugin management, master-slave architecture, delivery pipeline vs declarative pipeline	6
3	Testing/Continuous Integration/Continuous DeploymentSelenium: Basic terminology, features, limitations, selenium vs QTP, selenium	8



SYMBIOSIS INSTITUTE OF TECHNOLOGY

Symbiosis International (Deemed University)

(Established under section 3 of the UGC Act, 1956)

Founder: Prof. Dr. S. B. Mujumdar, M. Sc., Ph. D. (Awarded Padma Bhushan and Padma Shri by President of India)

	tool suite, selenium with maven/JenkinsJenkins: Introduction, work flow, continuous integration, advantage and disadvantages, architecture: master-slave, setup with github vs maven, configuration, management, user management, pipeline, notification, reporting, code analysis, distributed builds, automated deployment, metrics and trends, server maintenance, continuous deployment, Jenkins managing plugin, backup plugin. Jenkin vs teamcity vs Travis CI vs CircleCI vs Ansible vs Hudson vs GoCD vs maven.Define deployment, characteristics of deployment tools, benefits, learn any one deployment tools from the list: GIT action / XL Deploy/ Octopus Deploy/ JUJU/argonaut/ flosun/ codefresh/ launch darkly/ harness/ rundeck/spinnaker/ urban code/ Capistrano	
4	Operate using Ansible / Puppet / Docker / KubernetesAnsible: Introduction, workflow, architecture, various commands, playbook, roles, modules, shell, YAML, file management, ansible vs chef vs puppet.Puppet: architecture, components, applications, installation, coding style, modules, file server, classes, function, type provider, template custom function. Orchestration ToolsDocker: Introduction, Architecture, Containerization, lifecyscle, CLI, port binding, detached and foreground mode, file system, registry, stirage, volume, compose and swarm.Kubernetes: Core Concepts, Understand Pods, replica set and replication Controller, deployments, daemonsets, rolling updates and rollbacks, scaling application, services, persistent vs primitives, secret and configMaps, headless services, statefulsets, ingress	10
5	Monitoring Nagios: Introduction, features of Nagios, architecture: scheduler, GUI, plugin, installation of Nagios core, advantage and disadvantage. Prometheus and Grafna : Introduction to Prometheus and Grafana, Prometheus and Grafana Setup, Monitoring using Prometheus, Dashboard Visualization using Grafana, creating a Dashboard to monitor the Pipeline	4

Recommended Books:

Sr. No.	Book title	Authors	Publishers
1	A Practical Guide to Continuous Delivery	Eberhard Wolf	Addison-Wesley
2	Devops with windows server 2016	Ritesh Modi	PACKT
3	Implementing Devops with Ansible 2	Joathan McAllister	PACKT
4	The Devops 2.0 Tool Kit	Viktor Farcic	PACKT



॥ वसुधैव कुटुम्बकम् ॥

SYMBIOSIS INSTITUTE OF TECHNOLOGY

Symbiosis International (Deemed University)

(Established under section 3 of the UGC Act, 1956)

Founder: Prof. Dr. S. B. Mujumdar, M. Sc., Ph. D. (Awarded Padma Bhushan and Padma Shri by President of India)

Pedagogy:

1. Classroom teaching but need to be done in LAB as HANDS ON session
2. Hands on Exercise
3. Capstone Projects

Evaluation:

A. Continuous Assessment

- Unit test
- Hands on assignment
- Capstone Project Presentation
- Quizzes

B. End Semester Examination

- Written Examination

Benchmarked against similar courses in other national/ international universities /organizations:

Sr. No.	Name of the Course	Name of University where it is offered
1.	Advanced Certificate Program in Devops	IIIT Bangalore
2.	PG program in Devops	Belhaven University

Name of the experts designing the course

Sr. No.	Name	Designation	Organization/ Institute
1	Dr. Kailash Shaw	Associate Professor	SIT
2	Mr. Yash Shah	Technology Mentor	SWABHAV Tech Lab