

SVKM's NMIMS Deemed-to-be University
Mukesh Patel School of Technology Management and Engineering

Program : Master of Computer Applications (MCA)				Semester: III	
Course: DevOps				Code: 703DB0E020	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50
Pre-requisite: Introduction to Modern Application Development					
Course Objective The aim of the course is to provide in-depth knowledge of various DevOps tools. It will expose students to hands-on practices in Continuous Development, Configuration Management, Continuous Integration, and finally, Continuous Monitoring of software throughout its development life cycle					
Course Outcomes After completion of the course, students will be able to - <ol style="list-style-type: none"> 1. Describe the DevOps Process and Lifecycle 2. Build different versions of the source code and deploy containers 3. Develop applications and integrate the CI/CD Pipeline 					
Detailed Syllabus					
Unit	Description				Duration
1.	Introduction to DevOps DevOps and ITIL, Benefits of working in a DevOps environment, DevOps Lifecycle, How DevOps affects Architecture, DevOps Delivery Pipeline				03
2.	Managing Code The need for Source Code, Overview of Version Control systems Setting up a basic Git server, Hosted Git Server, Branching and merging in Git, Git Server implementation, Working with Remote repository				03
3.	Continuous Integration and Delivery Jenkins Architecture, Plugin Management in Jenkins, Jenkins Security Management, Notification in Jenkins, Jenkins Master-slave architecture, Jenkins Delivery Pipeline, Jenkins Declarative pipeline				04
4.	Configuration Management Using Ansible Introduction to Configuration Management, Infrastructure as Code, Introduction to Ansible, Ansible Architecture, Inventory Management, Ansible Modules, AD-HOC Commands, Ansible Playbooks, Ansible Roles				04
5.	Containerization Running a Container, Reuse Container, Docker Architecture, Container Lifecycle, Docker CLI, Port Binding, Detached and Foreground Mode, Dockerfile, Create a Docker Image, Run A custom Image, Share image,				04



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6.	Orchestration using Kubernetes Kubernetes Core Concepts, Understanding Pods, Life-cycle of a Pod, Replica Set and Replication Controller Deployments, Daemon Set, Kubernetes workloads	04
7.	Provisioning using Introduction to Terraform, Terraform vs Ansible, Terraform Architecture, Terraform Configuration, Terraform Common Commands, Managing Terraform Resources, Terraform State	02
8.	DevOps on Cloud Why Cloud, introduction to Cloud Computing, Why DevOps on Cloud, Introduction to AWS, Various AWS services, DevOps using AWS, Continuous integration (CI), continuous delivery (CD), infrastructure as code, microservices, monitoring and logging, and communication and collaboration. Hands-on labs give you experience building and deploying AWS Cloud Formation templates and CI/CD pipelines that build and deploy applications on Amazon Elastic Compute Cloud (Amazon EC2), serverless applications, and container-based applications.	06
Total		30
Text Books <ol style="list-style-type: none"> 1. Joakim Verona, <i>Practical Devops</i>, 2nd Edition, Ingram short title Publisher, 2018. 2. Jennifer Davis, Ryn Daniels, <i>Effective DevOps: Building a Culture of Collaboration, Affinity, and Tooling at Scale</i>, 1st Edition, O'Reilly Publisher, 2016. 		
Reference Books <ol style="list-style-type: none"> 1. Veselin Kantsev, <i>Implementing Devops on Aws</i>, 1st Edition, Ingram short title Publisher, 2017. 2. Nigel Poulton, <i>The Kubernetes Book</i>, 1st Edition, Kindle, 2022. 3. Nigel Poulton, <i>Docker Deep Dive</i>, 1st Edition, Kindle, 2016. 4. Ankita Patil, Mitesh Soni, <i>Infrastructure Automation with Terraform</i>, 1st Edition, BPB Publications, 2022. 		
Laboratory Work 8 to 10 programming exercises (and a practicum) based on the syllabus		



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