Course Code	18CSE316J	Course Name	ESSENTIALS IN CLOUD AND DEVOPS	Course Category	E	*Professional Elective*	L	T	P	C
							2	0	2	3

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*Networking and Communications*	**Data Book / Codes/Standards**	*Nil*		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*
CLR-1 :	To introduce students to the basic concepts and techniques of the entire application Lifecycle
CLR-2 :	Understanding of the Quality Assurance throughout the application lifecycle
CLR-3 :	Understanding of the Security Terms integrated with development and Operations
CLR-4 :	To study the various use of technology stack and tooling for reliability
CLR-5 :	To study the various deploying code and Provisioning Infrastructure
CLR-6 :	To introduce students to the basic concepts and techniques of the entire application Lifecycle

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	**Learning**			**Program Learning Outcomes (PLO)**															
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO – 3
CLO-1 :	Analyses the entire application lifecycle through techniques	*3*	*80*	*70*	*L*	*H*	-	-	-	-	-	-	-	-	-	*H*	-	-	-
CLO-2 :	Identify and apply quality and security throughout the lifecycle	*3*	*85*	*75*	-	*H*	*L*	-	*H*	-	-	-	-	-	-	*H*	-	-	-
CLO-3 :	Suggest and ensure a good quality for any given application updates and infrastructure changes	*3*	*75*	*70*	*H*	-	-	*H*	*H*	-	-	-	-	-	-	*H*	-	-	-
CLO-4 :	Apply the appropriate computing resources elastic and responsive to frequent changes.	*3*	*85*	*80*	*H*	-	-	*H*	*H*	-	-	-	-	-	-	*H*	-	-	-
CLO-5 :	Design systems by using micro services architecture, decouples large, complex systems into simple independent projects	*3*	*85*	*75*	*H*	-	-	*H*	*H*	-	-	-	-	-	-	*H*	-	-	-
CLO-6 :	Modify existing traditional software development and management process to improve speed enabled organization	*3*	*80*	*70*	-	-	-	*H*	*H*	-	-	-	*H*	*H*	-	-	-	-	-

Duration (hour)		**INTRODUCTION**	**LINUX and SCRIPTING**	TERRAFORM&ANSIBLE	DOCKER &KUBERNTESE	DevOpsOPERATION and MANAGEMENT
S-1	SLO-1	*Introduction to Cloud FundamentalsFundamentals of AWS,* Managing IAM	*Bash Shell Scripting Overview,*	*Infrastructure as Code Defined,*	*Docker Engine Architecture,*	*DevOps Foundations and Automatic Testing Statergy for Application Deployemenet, Monitoring*
	SLO-2	Introduction to S3 simple storage service	*Basics Steps to Write and Execute Bash Shell Scripting With an Example*	*Impotence and Consistency*	*Docker Image*	*Introduction to GIT ,Gradle, Selinium, Jenkins*
S-2	SLO-1	*Security, EC2 Instance*	*List of General Purpose Commands and Help to Understand the Usage of a Command, Redirection Operators and STDIN, STDOUT & STDERR*	*Push or Pull Benefits of Infrastructure as Code*	*Basic Container Operations*	*Case Study 1: Three Tier web application using docker and Kubernetes*
	SLO-2	*Creating AWS Account, Identity and Access Management (IAM) Basics*	*Complete Echo Command, Working with Variables*	*Describe plugin based architecture*	*Interacting with a Running Container*	
S-3	SLO-1	***Lab1: Creating AWS***	***Lab 4:* Installation of Linux**	***Lab7:Handle Terraform and provider installation and versioning***	***Lab 10: Installing Docker Service with Configuration***	***Lab 13: Installation of GIT, Gradle, Selinium, Jenkins***
	SLO-2					
S-4	SLO-1	*Creating AWS Account, Identity and Access Management (IAM) Basics Adding an IAM Admin - GENERAL ACCOUNT*	*Practice with grep Command and Usage of Patterns in grep Command Cut command Practice with cut Command awk command*	*Working with Data in Terraform Input Variable Syntax*	*Inspecting a Container,*	*Case Study 2:Infrastructure as Code Using Terraform (Modules)*
	SLO-2	*Adding an IAM Admin User - PRODUCTION ACCOUNT*	*Input and Output Commands for Shell Scripting*	*Terraform Data Types*	*Copying Contents into ContainerPublishing*	*Case Study 3:Configuration Management using Ansible (Roles)*
S-5	SLO-1	*Access Keys, EC2 Basics,*	*Command Chaining using Logical operators*	*Adding Outputs to the Configuration Validate the Configuration*	*Ports,Troubleshooting*	*Case Study 1: Application code management using Git*
	SLO-2		*Scheduling jobswithcrontab,*	*Using the Validate Command*	*Docker Daemon*	

S-6	SLO-1	***Lab 2: Creating Access keys and setting up AWS***	***Lab:5 Practicing Linux commands***	***Lab 8: How to install Ansible***	***Lab 11: Deployment of kubeadm***	***Lab 14 :Mini project on the above technology***
	SLO-2		*Configure networking and hostname resolution statically or dynamically*		*9094524*	
S7	SLO-1	*EC2 Creation* *EC2 Storage services,*		*Need of Ansible, Architecture and Process flow of Ansible, Package, Services,Ansible Module Fundamentals*	*Kubernetes Architecture,Kubernets-Scheduling Logging & Monitoring, Cluster Maintenance, Security &Storage* *Choosing Kubernets infrastructure*	*Case study 2:Building CI/CD pipeline to deploy, new version of Application (Jenkins)*
	SLO-2	*Simple automation with cloud formation*	*Configure network services to start automatically at boot ,*	*Advanced Execution -gather_facts, Accelerated Mode and Pipelining*	*Creating Helm charts*	
S-8	SLO-1	*Virtual Private cloud*	*Start, stop, and check the status of network services Configure HTTP server log files*	*Troubleshooting, Testing and Validation*	*Role Based Access Control, Role Based Access Control*	*Case Study3:Bulding Monitoring for application*
	SLO-2	*Router R3 fundamentals*	*Restrict access to a web page, Manage and configure containers*	*Syntax-Check & Dry-Run: syntax-check,Debuggig*	*Role Based Access Control Trobuleshooting,kubernets, Designing a Kubernets cluster, Helm*	
S-9	SLO-1	***Lab 3: Instance creation EC2 S3 life cycle configuration***	***Lab 6: Manage and configure Virtual Machines***	***Lab 9: Create Roles in Ansible***	***Lab 12:*****Installing Kubernetes without Helm**	***Lab 15 : Mini Project on the above technology***
	SLO-2					

Learning Resources	1. The DevOps Handbook, Gene Kim, Jez Humble, Patrick Debois, John Allspaw and John WillisJason Bell, IT revolutionPress,2016. 2. The DevOps Adoption Playbook: A Guide to Adopting DevOps in a Multi-Speed IT Enterprise.Sanjeev Sharma 1st Edition ,Wiley,2017.	3. Mastering Linux Shell Scripting : A practical guide to Linux command-line, Bash scripting, and Shell programming, Andrew Mallett Mokhtar Ebrahim ,Ingram short title,Second Edition,2018.

Learning Assessment

	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (15%)		CLA – 3 (15%)		CLA – 4 (10%)#			
		Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab	Theory	Lab
Level 1	Remember	*20%*	*20%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
	Understand										
Level 2	Apply	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*
	Analyze										
Level 3	Evaluate	*10%*	*10%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts