LOK JAGRUTI UNIVERSITY (LJU)

INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of CE/IT/CSD/AIML/AIDS/RAI/CSE/CST/CS&IT/CEA (701,702,703,704,705,706,712,713,714,715)

Bachelor of Technology (B.E.) – Semester – V

Course Code:	**117013593, 117023593, 117033593, 117043593, 117053593, 117063593, 117123593, 117133593, 117143593, 117153593**
Course Name:	Cloud Computing
Category of Course:	Professional Elective Course (PEC)
Prerequisite Course:	--

Teaching Scheme

Lecture (L)	Tutorial (T)	Practical (P)	Credit	Total Hours
3	0	4	5	30

Syllabus

Unit No.	Topic	Prerequisite Topic	Successive Topic	Teaching Hours
01	**Cloud Concepts Overview** 1.1 Introduction to cloud computing 1.2 Advantages of cloud computing 1.3 Example Introduction to Amazon Web Services (AWS) 1.4 Moving to the Cloud – The AWS Cloud Adoption Framework	--	--	**4 (10%)**
02	**Cloud Economics and Billing** 2.1 Fundamentals of pricing 2.2 Total Cost of Ownership 2.3 Centralized billing example AWS Organizations 2.4 AWS Billing and Cost Management 2.5 Technical support	--	--	**4 (5%)**
03	**Global Infrastructure Overview** 3.1 Global Infrastructure 3.2 Services and service category overview (AWS cloud)	--	--	**3 (10%)**
04	**AWS Cloud Security** 4.1 Shared responsibility model 4.2 Identity and Access management (IAM) 4.3 Securing a new AWS Account 4.4 Securing accounts 4.5 Securing data on Cloud 4.6 Working to ensure compliance	--	--	**6 (10%)**
05	**Networking and Content Delivery** 5.1 Networking basics 5.2 Amazon VPC 5.3 VPC networking & security 5.4 Amazon route 53 5.5 Amazon CloudFront	--	--	**5 (15%)**
06	**Compute** 6.1 Compute services overview 6.2 Amazon EC2 6.3 Amazon EC2 cost optimization 6.4 Container services 6.5 Introduction to AWS Lambda 6.6 Introduction to AWS Elastic Beanstalk	--	--	**5 (15%)**
07	**Storage** 7.1 Amazon Elastic Block Store (EBS) 7.2 Amazon Simple Storage Service (S3) 7.3 Amazon Elastic File System (EFS) 7.4 Amazon Simple storage service glacier	--	--	**5 (10%)**
08	**Databases** 8.1 Amazon Relational Database Service (RDS) 8.2 Amazon DynamoDB 8.3 Amazon Redshift 8.4 Amazon Aurora	--	--	**4 (10%)**
09	**Cloud Architecture** 9.1 AWS Well-Architected Framework 9.2 Reliability and availability 9.3 AWS Trusted Advisor	--	--	**2 (5%)**
10	**Automatic Scaling and Monitoring** 10.1 Elastic Load Balancing 10.2 Amazon Cloudwatch 10.3 Amazon EC2 Auto Scaling	--	--	**2 (10%)**

Sr. No.	Practical Title	Link to Theory Syllabus
01	Set up a free-tier AWS account and explore the AWS Management Console.	Unit-1
02	Calculate Total Cost of Ownership (TCO): Use the AWS TCO Calculator to compare costs between on-premises and AWS cloud.	Unit-2
03	Enable encryption for an S3 bucket and test uploading encrypted files.	Unit-4
04	Create a VPC: Set up a Virtual Private Cloud with public and private subnets.	Unit-5
05	Launch an EC2 instance in a VPC: Attach a public IP to test connectivity.	Unit-5
06	Deploy a containerized app: Use Amazon Elastic Beanstalk to deploy a web application.	Unit-6
07	Create an S3 bucket: Upload files and configure bucket policies for access control.	Unit-7
08	Launch an RDS instance: Deploy a MySQL database and connect to it via a client tool	Unit-8
09	Create a NoSQL database: Use DynamoDB to store key-value pairs.	Unit-8
10	Set up Elastic Load Balancing: Distribute traffic between two EC2 instances.	Unit-10

Major Components/ Equipment	
Sr. No.	**Component/Equipment**
1	Computer Systems
2	Cloud Service Provider Account

Proposed Theory + Practical Evaluation Scheme by Academicians
(% Weightage Category Wise and it's Marks Distribution)

L:	3	T:	0	P:	4

Note: In Theory Group, Total 4 Test (T1+T2+T3+T4) will be conducted for each subject.
Each Test will be of 25 Marks.
Each Test Syllabus Weightage: Range should be 20% - 30%

Group (Theory or Practical)	Group (Theory or Practical) Credit	Total Subject Credit	Category	% Weightage	Marks Weightage
Theory	3	5	MCQ	36%	60
Theory			Theory Descriptive	24%	40
Theory			Formulas and Derivation	0%	0
Theory			Numerical	0%	0
Expected Theory %	**60%**		**Calculated Theory %**	**60%**	**100**
Practical	2		Individual Project	0%	0
Practical			Group Project	28%	70
Practical			Internal Practical Evaluation (IPE)	0%	0
Practical			Viva	12%	30
Practical			Seminar	0%	0
Expected Practical %	**40%**		**Calculated Practical %**	**40%**	**100**
Overall %	**100%**			**100%**	**200**

Course Outcome	
1	Understand the fundamental concepts of cloud computing, its architecture, and key services like AWS.
2	Analyze and implement cost-effective cloud solutions using billing, pricing models, and resource optimization techniques..
3	Design secure and scalable cloud infrastructures leveraging IAM, VPC, and storage services.
4	Develop and deploy cloud-native applications using compute, databases, and automation tools.
Suggested Reference Books	
1	Cloud Computing: Concepts, Technology & Architecture - Thomas Erl, Ricardo Puttini, Zaigham Mahmood
2	AWS Certified Solutions Architect Official Study Guide - Ben Piper, David Clinton
3	Cloud Computing Bible - Barrie Sosinsky
4	Architecting the Cloud - Michael J. Kavis
5	Mastering AWS: Advanced Architecture and Deployment - Cybellium Ltd

List of Open Source Software/Learning website	
1	OpenStack - https://www.openstack.org/
2	Kubernetes - https://kubernetes.io/
3	AWS Training and Certification - https://aws.amazon.com/training/
4	edX - https://www.edx.org/