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GANPAT UNIVERSITY									
FACULTY OF ENGINEERING AND TECHNOLOGY									
Programme	Bachelor of Technology					Branch/Spec.	Computer Science & Engineering (BDA/CS)		
Semester	VII					Version	1.0.0.1		
Effective from Academic Year			2022-23			Effective for the batch Admitted in			June 2019
Subject code	2CSE70E19		Subject Name			Cloud Computing Essentials			
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:

Operating system, Computer Network, Database Management Systems, Programming, Virtualization, Fundamentals of Microservices, Software Engineering approaches

Learning Outcome:

After completion of the course, student will be able to:

- Understand the principles of Cloud Computing, Cloud Economics, DevOps & cloud platforms.
- Apply the appropriate Cloud Services to various scenarios.
- Deploy, manage and operate applications on scalable, highly available and fault-tolerant Cloud Platforms.
- Develop skills for implementing cloud solutions for various scenarios.

Theory syllabus

Unit	Content	Hrs
1	**Fundamentals of Cloud Computing** Concept of Cloud computing, Characteristics, Features and Applications, Cloud Architecture, Service models, Deployment models, Role of Cloud in Data Science domain	**4**
2	**Cloud Economics** Service Level Objectives, Service Level Agreements (SLAs), Pricing, Billing, Accounting, Optimization, Cloud performance issues and measures	**5**
3	**Infrastructure Services on Cloud** Introduction to Infrastructure, Virtualization, Hypervisors, Server virtualization, Storage Virtualization, Data Center Fundamentals, DB Cluster, Compute, Network and Storage Infrastructure, Database Services, Virtual Firewall and Security Groups	**10**
4	**Load Balancing and Autoscaling** Need, Load balancing approaches, Load Balancer types, Load balancing algorithms, Round Robin Algorithm, Least Connections Algorithm, IP Hashing based Algorithms, Randomized Algorithms, Load balancing Vs auto-scaling, Auto scaling Policies and Algorithms, threshold-based Algorithm, Load Prediction based algorithm, QoS based Algorithm	**8**
5	**Distributed File Systems & Programing** Distributed File Systems for Cloud, Map Reduce programing model, Google File Systems, Hadoop Distributed File System	**8**
6	**Cloud Security** Identity & Access Management on Cloud, Understanding security, Issues of cloud security, Infrastructure security, Data Security, Access Management, Solutions	**8**
7	**Edge Computing** Need and Model, Use cases, Drivers and Barriers, Edge Platforms & Computing Latency, Edge computing hardware architectures	**2**

Self-Study:

Case study AND REAL CLOUD SERVICES
Distributed File System, HDFS, DevOps

Practical content

Practical's will be based on:

- Working with IaaS of Public cloud platforms
- Implementation of Platform as a service (PaaS) in private and public cloud environment

Mooc Course

Course Name: AWS Academy Cloud Foundations (ACF)
Link: https://www.awsacademy.com/servlet/servlet.FileDownload?file=0151K000003qL84QAE

Text Books

1	Barrie Sosinsky: "Cloud Computing Bible", Wiley-India.
2	RajkumarBuyya, James Broberg, Andrzej M. Goscinski: "Cloud Computing: Principles and Paradigms", Wiley.

Reference Books

1	Nikos Antonopoulos, Lee Gillam: "Cloud Computing: Principles, Systems and Applications", Springer.
2	Ronald L. Krutz, Russell Dean Vines: "Cloud Security: A Comprehensive Guide to Secure Cloud Computing", Wiley-India.
3	Tim Mather, Subra Kumara swamy, ShahedLatif, Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, O'Reilly Media.

Course Outcomes:

CO	Description
CO1	Understand the principles of Cloud Computing, Cloud Economics, DevOps & cloud platforms.
CO2	Apply the appropriate Cloud Services to various scenarios.
CO3	Deploy, manage and operate applications on scalable, highly available and fault-tolerant Cloud Platforms.
CO4	Develop skills for implementing cloud solutions for various scenarios.

Mapping of CO and PO:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3	3	2	1	2	1	2	3	2
CO2	2	3	2	2	2	3	2	2	2	2	3	2
CO3	3	3	3	3	2	3	2	2	3	2	2	1
CO4	3	3	3	2	3	3	3	2	2	3	3	3