Name of the Programme : **Bachelor of Computer Applications**
Course Code : **CSA-302**
Title of the Course : **Cloud Computing**
Number of Credits : **4 (3T + 1P)**
Effective from AY : **2024-25**

Pre-requisites for the Course:	The student should have basic knowledge of operating systems and computer networks.	
Course Objectives:	1. To describe the fundamentals of Cloud computing. 2. To understand the architecture and the types of Cloud systems. 3. To apply the concepts of service models and deployment models to decide suitability of migrating to cloud solutions. 4. To compare the services and applications made available by leading Cloud Service Providers	
Units	**Content**	**No of hours 75 (45T+30P)**
I	**Introduction to Cloud Computing** **Overview of Computing Paradigm** • Recent trends in Computing, Types of Computing: Parallel/Distributed computing, Grid Computing, Utility Computing, Cluster Computing, Cloud Computing. **Cloud Computing** • Introduction to Cloud Computing, Properties and Characteristics, Cloud service providers, Cloud applications, Cloud Architecture, Cloud Service Models **Deployment Models** • Types: Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud; Key Drivers to adopting Cloud; Challenges and Issues • Popular Cloud Vendors (Amazon, Google, Microsoft etc.)	**15**
II	**IaaS - Infrastructure as a Service** • Introduction to Virtualization, Characteristics of Virtualized environment, Virtualization of Cloud, Types of Virtualization, Pros and Cons of Virtualization • Technology Examples- Xen, VMware, Microsoft Hyper-V **Capacity Planning** • Introduction, Defining Baseline and Metrics-Baseline Measurements, System Metrics, Load Testing, Resource Ceilings, Server and Instance types; Network Capacity, Scaling	**15**

III	**PaaS & SaaS** **Platform as a Service** • Introduction: Introduction to PaaS, Characteristics, Service Oriented Architecture (SOA), Applications, Issues and challenges. • Cloud Platform and Management: Computation, Storage, Case studies, Examples: Google App Engine, Microsoft Azure, SalesForce.com, Amazon AWS **Software as a Service** • Introduction to SaaS, Characteristics, Web Services, Web 2.0, Web OS, APIs, Service management, SaaS Implementation, Security, Case studies, Cloud Issues and Challenges: Cloud provider Lock-in, Security	**15**
IV	**List of Practicals:** The broad area of practical problems is mentioned/ suggested below:	**30**
Week 1 & 2	• Understanding Computer Network fundamentals and Designing LANs	**05**
Week 3 to 10	• Working on tools used in cloud computing online a) Storage b) Sharing of data c) Manage your calendar, to-do lists (e.g. Office365) d) A document editing tool • Leveraging any cloud service to work on document, spreadsheet, presentation, task management and collaborative tools in real time; chat with other collaborators. (e.g. Google sheet, docs & Google Meet, Google Keep)	**15**
Week 11 to 15	• Enlisting various companies in cloud business and the corresponding services provided by them and tag them under SaaS, PaaS & IaaS. • Exploring public cloud service providers' tools for exploring the usage of IaaS, PaaS and SaaS cloud services. a. AWS EC2 / Azure Compute b. AWS S3 / Azure Storage c. AWS VPC / Azure Vnets d. AWS Security / Azure Security	**10**
Pedagogy	1. The lecture method need not be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes. You may use a. Video/Animation to explain various concepts. b. Collaborative, Peer, Flipped Learning, etc. 2. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding. 3. Explore the cloud platforms to solve real life problems.	

	4. To promote self-learning, give at least one assignment where they can complete one MOOCs (certificate or equivalent) course wherever necessary. Test their understanding through quizzes or presentations.
References/ Readings:	**Main Reading:** 1. Buyya, R., Vecchiola, C., & Selvi, T. (2013). *Mastering Cloud Computing*. TMH. 2. Halper, F., Hurwitz, R., Bloor, R., & Kaufman, M. (2010). *Cloud Computing For Dummies.* Wiley India Pvt. Ltd. **Additional Reading:** 1. Buyya, R. K., Broberg, J., & Goscinski, A. M. (2011). Cloud Computing: Principles And Paradigms. Wiley India Pvt. Ltd. ISBN-13: 978-81-265-4125-6 2. Sosinsky, B. (2011). Cloud Computing Bible. Wiley India Pvt. Ltd. ISBN-13: 978-81-265-2980-3
Course Outcomes:	**On completion of the course, students will be able to:** 1. Recall the fundamentals of cloud computing. 2. Understand the architecture and the types of cloud servicemodels 3. Apply the concepts of service models and deployment models for for migration to cloud. 4. Analyze the services and applications made available by leading Cloud Service Providers