Uttarakhand Technical University, Dehradun
New Scheme of Examination as per AICTE Flexible Curricula
Computer Science and Engineering, VI-Semester Open Elective
CS- 605 (D) Distributed Systems and Cloud Computing

Course Objectives:
- To explain the evolving computer model called cloud computing.
- To introduce the various levels of services that can be achieved by cloud.
- To describe the security aspects in cloud.

Learning Outcomes:
1. use public and private cloud solutions for computational science and engineering applications
2. discuss key concepts of cloud computing services, such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS);
3. asses the suitability of cloud computing infrastructures for different scientific applications;
4. implement software for cloud-based distributed computing using the technology presented in the course;
5. Critically analyze and present solutions and implementations in writing and orally.

Course Content:

UNIT- I : Systems Modeling, Clustering and Virtualization: Distributed System Models and Enabling Technologies, Computer Clusters for Scalable Parallel Computing, Virtual Machines and Virtualization of Clusters and Data centers.

UNIT- II : Foundations: Introduction to Cloud Computing, Migrating into a Cloud, Enriching the 'Integration as a Service' Paradigm for the Cloud Era, The Enterprise Cloud Computing Paradigm.

UNIT- III : Infrastructure as a Service (IAAS) & Platform and Software as a Service (PAAS / SAAS): Virtual machines provisioning and Migration services, On the Management of Virtual machines for Cloud Infrastructures, Enhancing Cloud Computing Environments using a cluster as a Service, Secure Distributed Data Storage in Cloud Computing. Aneka, Comet Cloud, T-Systems', Workflow Engine for Clouds, Understanding Scientific Applications for Cloud Environments.

UNIT- IV : Monitoring, Management and Applications: An Architecture for Federated Cloud Computing, SLA Management in Cloud Computing, Performance Prediction for HPC on Clouds, Best Practices in Architecting Cloud Applications in the AWS cloud, Building Content Delivery networks using Clouds, Resource Cloud Mashups.

UNIT – V : Governance and Case Studies: Organizational Readiness and Change management in the Cloud age, Data Security in the Cloud, Legal Issues in Cloud computing, Achieving Production Readiness for Cloud Services.

Text Book
1. K. Hwang, G. Fox and J. Dongarra, "Distributed and Cloud Computing", Morgan Kaufmann Publishers, 2012.
2. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, "Cloud Computing: Principles and Paradigms", Wiley, 2011.