RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Artificial Intelligence & Data Science, VII-Semester

Departmental Elective-702 (A) Cloud Computing

Aim:

Thiscoursegivesstudentsaninsightintothebasicsofcloudcomputingalongwithvirtualization,Utility Computing,ElasticComputing&gridcomputing.Itwillprovidethestudentsbasicunderstandingaboutc loudapplications andimplementations.ItwillalsoprovideanunderstandingofIssuesandChallengeswhile migratingto CloudComputing.

CourseObjectives:

1. Explain the core concepts of the cloud computing paradigm, the characteristic and advantages of cloud computing.
2. Explain the concept of Virtualization, Utility Computing, Elastic Computing & grid computing.
3. Identify resource management fundamentals, i.e., resource abstraction, managing infrastructure in cloud computing, apply the fundamental concepts to understand the trade-offs in power, efficiency and cost in cloud paradigm.
4. Study Issues and Challenges while migrating to Cloud Computing technologies, applications and implementations.
5. Study of various Open Source and Commercial Cloud Computing Platforms.

CourseOutcomes:

After the completion of this course, the students will be able to:

1. Understand Cloud Computing, its characteristic and advantages.
2. Understand the concept of Virtualization Utility Computing, Elastic Computing & grid computing.
3. Apply cloud resource management fundamental to utilize there sources efficiently and cost effectively in cloud paradigm.
4. Understand Cloud security fundamentals & Issues in cloud computing
5. Develop real life Cloud Computing based projects.

Syllabus

Unit I: Introduction To Cloud Computing: Definition, Characteristics, Components, Cloud Architecture: Software as a Service, Plat form as a Service, Infrastructure as Service. Cloud deployment model: Public clouds–Private clouds–Community clouds-Hybrid clouds-Advantages of Cloud computing. Comparing cloud providers with traditional IT service providers.

Unit II: Services Virtualization Technology and Study of Hypervisor: Utility Computing, Elastic computing & grid computing. Study of Hypervisor Virtualization applications in enterprises, High-performance computing, Pitfalls of virtualization Multitenant software: Multi-entity support, Multi schema approach.

Unit III: Installing cloud platforms and performance evaluation: Organizational scenarios of clouds, Administering & Monitoring cloud services, load balancing, Resource optimization, Resource dynamic reconfiguration, implementing real time application, Mobile Cloud Computing and edge computing.

Unit IV: Cloud security fundamentals & Issues in cloud computing: Secure Execution Environments and Communications in cloud, General Issues and Challenges while migrating toCloud. The Seven-step model of migration into a cloud, Vulnerability assessment tool for cloud, Trusted Cloud computing, Virtualization security management-virtual threats,VM Security Recommendations and VM-Specific Security techniques.QOS Issues in Cloud, Depend ability, data migration, challenges and risks in cloud adoption.

UnitV: Case Study on Open Source and Commercial Clouds: Open Stack, Eucalyptus, Open Nebula, Apache Cloud Stack, Amazon (AWS),Microsoft Azure, Google cloud etc.

TextBook(s)

1. Barrie Sosinsky:"CloudComputingBible",Wiley□India,2010
2. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski: "Cloud Computing: Principles and Paradigms",Wiley, 2013.
3. RajkumarBuyya,ChristianVecchiola,S.Thamaraselvi,"MasteringCloudComputing",McGraw Hill, 2013.

ReferenceBooks

1. NikosAntonopoulos,LeeGillam:"CloudComputing:Principles,Systemsand Applications",Springer,2012
2. Ronald L. Krutz, Russell Dean Vines: "Cloud Security: A Comprehensive Guide to Secure CloudComputing", Wiley□India,2010
3. TimMalhar,S.Kumaraswammy,S.Latif,"CloudSecurity&Privacy",SPD,O'REILLY, 2009
4. Cloud Computing: Fundamentals, Industry Approach and Trends by Rishabh Sharma - John Wiley Publication.