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18BC307 CLOUD COMPUTING

Course Description and Objectives:

This course deals with a new type of a computing model, which enables information, software, and shared resources to be provisioned over the network as services in an on-demand manner. The objective of this course is to enable the student to understand parallel and distributed computing, virtualization, architecture of cloud, Aneka, Thread programming, Concurrent programming and MapReduce programming.

Course Outcomes:

The student will be able to:

- Understand the systems, protocols and mechanisms to support cloud computing.
- Develop applications for cloud computing by using platforms and technologies.
- Understand the hardware requirements for cloud computing.

Skills:

- Developing cloud applications by solving real-world problems.
- Building an own cloud computing environment.
- Compare and evaluate Parallel Vs Distributed architectures.

Activities:

- Deploy applications over commercial cloud computing infrastructures such as Amazon Web Services, Windows Azure, and Google AppEngine.
- Program data intensive parallel applications in the cloud.
- Analyze the performance, scalability, and availability of the underlying cloud technologies and software.
- Solve a real world problem using cloud computing through group collaboration.

Syllabus

UNIT – 1

10 Hours

AN OVERVIEW OF CLOUD COMPUTING: Cloud computing at a glance, Historical developments, Building cloud computing environments, computing platforms and technologies. Parallel Vs Distributed Computing, Elements of Parallel Computing, Elements of Distributed Computing, Technologies for Distributed Computing.

UNIT – 2**10 Hours**

CLOUD COMPUTING ARCHITECTURE:Cloud Reference Model, Types of Clouds, Economics ofClouds, Open Challenges; Characteristics, Virtualization techniques, Virtualization and Cloud Computing,Pros and Cons of Virtualization, Technology Examples.

UNIT – 3**10 Hours**

ANEKA:Cloud Application Platform, Framework Overview, Anatomy of the Aneka Container,Building Aneka Clouds, Cloud Programming and Management; Programming Applications with Threads,Multithreading with Aneka, Programming Applications with Aneka Threads.

UNIT – 4**9 Hours**

CLOUD PLATFORMS IN INDUSTRY AND APPLICATIONS:Amazon Web Services, Google AppEngine, Microsoft Azure; Scientific Applications– Healthcare, Biology, Geo-Science, BusinessApplications– CRM and ERP, Productivity, Social Networking, Media Applications, Multiplayer Online Gaming.

UNIT – 5**10 Hours**

ADVANCED TOPICS IN CLOUD COMPUTING:Energy Efficiency in Clouds, Market Based Managementof Clouds, Federated Clouds/Inter-Cloud, Third Party Cloud Services.

Text Book:

RajkumarBuyya, Christian Vecchiola, and S. ThamaraiSelvi, “Mastering Cloud Computing”, 1st Edition, McGraw Hill Publishing, 2013.

Reference Books:

1. RajKumarBuyya, Broberg J and Goscinski A, “Cloud Computing - Principles and Paradigms”, 1st Edition, Wiley, 2011.
2. Rittinghouse J W, and Ransome J F, “Cloud Computing - Implementation, Management,and Security”, 1st Edition, CRC Press, 2009.