

Course Structure

Course Code : SM7304

Course Title : Green Cloud Computing

Credit Hours : 3

Course Description

This graduate-level course investigates cloud computing models, techniques, and architectures. Cloud computing has evolved as a very important computing model, which enables information, software, and other shared resources to be provisioned over the network as services in an on-demand manner. Students will be exposed to the current practices in cloud computing. Topics may include distributed computing models and technologies, Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), Software-as-a-Service (SaaS), virtualization, security and privacy issues, performance and systems issues, capacity planning, disaster recovery, Cloud OS, federated clouds, challenges in implementing clouds, data centers, hypervisor CPU and memory management, cloud hosted applications, and other advanced and research topics in cloud computing. Course work will include homework assignments, presentations, and a term project that will provide exposure to scientific research in cloud computing.

Material may be covered from sources other than the text including research papers. Finally, the Cloud algorithm will be implemented on the Green and smart building.

Course Objectives

The student should become acquainted with:

- Cloud Computing including benefits, challenges, and risks
- Cloud Computing Models including Infrastructure/Platform/Software – as-a-service
- Public cloud, private cloud and hybrid clouds
- Cloud OS
- Cloud Architectures including Federated Clouds
- Scalability, Performance, QoS
- Data centers for Cloud Computing
- Principles of Virtualization platforms
- Security and Privacy issues in the Cloud
- VMWare ESX Memory Management
- Capacity Planning and Disaster Recovery in Cloud Computing

Course Topics

- Introduction to cloud computing.
- Distributed and parallel systems
- Virtualization
- Cloud service models
- Data storage 1
- Data storage 2
- Data processing 1
- Data processing 2
- Data security 1
- Data security 2
- Data centers
- Cloud Modeling, Prediction and Control for Smart Buildings

M.Sc. in Smart Control Systems for Energy Management

Course Structure

- Security and Privacy

References

- Alin Gales, Michael Schaefer, Mike Ebbers, “Green Data Center: steps for the Journey”, Shoff/IBM rebook, 2011
- Erl, Thomas, Puttini, Ricardo, and Mahmood, Zaigham (2013). Cloud Computing: Concepts, Technology & Architecture. Prentice Hall.