

Module I**Introduction, Cloud Infrastructure**

Cloud computing, Cloud computing delivery models and services, Ethical issues, Cloud vulnerabilities, Cloud computing at Amazon, Cloud computing the Google perspective, Microsoft Windows Azure and online services, Open-source software platforms for private clouds, Cloud storage diversity and vendor lock-in, Energy use and ecological impact, Service level agreements, User experience and software licensing. Exercises and problems.

Module II**Cloud Computing: Application Paradigms.**

Challenges of cloud computing, Architectural styles of cloud computing, Workflows: Coordination of multiple activities, Coordination based on a state machine model: The Zookeeper, The Map Reduce programming model, A case study: The Grep The Web application , Cloud for science and engineering, High-performance computing on a cloud, Cloud computing for Biology research, Social computing, digital content and cloud computing.

Module III**Cloud Resource Management and Scheduling.**

Policies and mechanisms for resource management, Application of control theory to task scheduling on a cloud, Stability of a two-level resource allocation architecture, Feedback control based on dynamic thresholds, Coordination of specialized autonomic performance managers, A utility-based model for cloud-based Web services, Resourcing bundling: Combinatorial auctions for cloud resources, Scheduling algorithms for computing clouds, Fair queuing, Start-time fair queuing, Borrowed virtual time, Cloud scheduling subject to deadlines, Scheduling Map Reduce applications subject to deadlines, Resource management and dynamic scaling, Exercises and problems.

TEXT BOOKS/ REFERENCES:

1 Rajkumar Buyya , James Broberg and Andrzej Goscinski, “*Cloud Computing Principles and Paradigms*”, Willey, 2014.

2. Dan C Marinescu, “*Cloud Computing Theory and Practice*”, Elsevier (MK), 2013.
3. Anthony T. Velte, Toby J. Velte and Robert Elsenpeter, “*Cloud Computing*”, Tata McGraw-Hill Education, 2009.
4. Barrie Sosinsky, “*Cloud Computing Bible*”, John Wiley & Sons, 2010.