Distributed & Mobile Computing

IS384

Title

Course Title: IS 384 - Distributed & Mobile Computing

Credit Rating: 12 credits, **Total Hours:** 120 hours, **Course Status:** Core

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Agenda

- Learning Objectives
- Course Contents
- Assessment Methods
- Recommended Reading
- Introduction to the Course

Learning Objectives

Course Aim:

Equip students with knowledge and skills for distributed and mobile system design and administration.

Learning Outcomes:

- Explain what a distributed system is.
- List principles underlying distributed systems.
- Design a distributed system.
- Describe mobile IP and differences from IP.
- Describe emerging interests in mobile computing.

Course Contents:

- Overview and Characterization of Distributed Systems
- Middleware Programming
- Transactions, Concurrency, and Replication Controls
- Time, Global States, Coordination, and Agreement
- Distributed File Systems
- Introduction to Mobile Computing
- Mobile Computing Technologies
- Emerging Mobile Technologies

Assessment Methods

Continuous Assessment: 30 marks

- Tests - 20 marks
- Assignments/Exercises - 10 marks

Final Examination: 70 marks

Overview of Distributed Systems

- Examples: Internet, cloud computing.
- How distributed systems share resources and work together.
- Characteristics: Reliability, scalability.
- Architectural models.

Design Challenges and Interconnections

- Challenges in building distributed systems.
- How components connect and communicate.
- Ensuring reliability and efficiency.
- Categorizing distributed systems.
- Understanding differences and similarities.

Middleware Programming

Learn how computer programs communicate and work together.

Socket Programming: Understand how programs connect and talk to each other.

RMI and RPC: Use special languages for programs to understand each other's requests.

Local and Remote Objects: Make objects in one place do things in another place.

Middleware Programming

- Web Services Programming: Learn how programs request and exchange data over the internet.
- **XML-RPC, SOAP, and RESTful Web Services**: Different ways programs talk to each other online.
- **Data Serialization**: Pack and unpack data for sending it over the internet (what are the rules).
- Middleware **Documentation**, and Middleware Programming **Security**

Reading List

- Ajay D. K. and M. Singhal., (2008), Distributed Computing: Principles, Algorithms, and Systems, 1st Edition, Cambridge University Press.
- Tanenboum A. S and M. van Steen., (2006), Distributed Systems: Principles and Paradigms, 2nd edition, Prentice Hall International
- Asoke K. Talukdar (2010), Mobile Computing, 2E, Tata McGraw-Hill Education.
- JeyasriArokiamary (2009), Mobile Computing, Technical Publications.
- Raj Kamal (2008), Mobile Computing, Oxford University Press, USA