

COURSE DESCRIPTION

Department and Course Number	CS 431 (formerly CS 438)	Course Coordinator	Bangalore
Course Title	Distributed Computing	Total Credits	3

Current Catalog Description

Introduction to distributed systems, distributed hardware and software concepts, communication, processes, naming, synchronization, consistency and replication, fault tolerance, security, client/server computing, web technologies, enterprise technologies.

Textbook

Distributed Systems: Principles and Paradigms, by Andrew S. Tanenbaum, Prentice Hall, 2002.

References

Building Web Services with Java: Making Sense of XML, SOAP, WSDL, and UDDI, by Steve Graham, Doug Davis, Simeon Simeonov, Glen Daniels, Peter Brittenham, Yuichi Nakamura, Paul Fremantle, Dieter Koenig, and Claudia Zentner, Sams, 2005.

Course Goals

- 1. Introduce the principles of distributed computing*
- 2. Introduce distributed programming paradigms through programming assignments on client-server and multi-tier architectures*

Prerequisites by Topic

Computer Organization and Assembly Language Programming

Major Topics Covered in the Course

- 1. Distributed systems – Hardware and Software concepts*
- 2. Communication and synchronization*
- 3. Consistency, replication, fault tolerance*
- 4. Security*
- 5. Client-server model and service oriented architecture*
- 6. Overview of CORBA, DCOM, EJB*
- 7. Web services architecture*

Laboratory projects (specify number of weeks on each)

- 1. Simple client-server programming (2 weeks)*
- 2. Developing multi-tier application (2 weeks)*
- 3. Distributed application development using Java (2 weeks)*
- 4. Developing and deploying web services (2 weeks)*

Estimate CSAB Category Content

	CORE	ADVANCED		CORE	ADVANCED
Data Structures	_____	_____	Computer Organization and Architecture	_____	<u>4</u>
Algorithms			Concepts of Programming Languages	_____	<u>2</u>
Software Design	_____	<u>20</u>			

Oral and Written Communications

Every student is required to submit at least 4 written reports (not including exams, tests, quizzes, or commented programs) of typically 5 pages and to make 0 oral presentations of typically 0 minutes duration.

Social and Ethical Issues

None

Theoretical Content

- 1. Distributed hardware and software concepts (6 hours)*
- 2. Distributed computing principles (6 hours)*

Problem Analysis

Each of the programming assignments involves analyzing the functionality and performance of the programs based on the programming paradigm.

Solution Design

Each programming assignment requires designing a solution, implementing and testing the solution.