Birla Institute of Technology & Science, Pilani
Hyderabad Campus

FIRST SEMESTER 2019-2020

Course Handout Part II

Date: 22-07-2019

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : *CS G554*
Course Title : Distributed Data Systems
Instructor-in-Charge : Manik Gupta

Scope and Objective of the Course:

With the ever-growing pervasive data and the subsequent computational requirements, distributed systems are becoming more and more widespread. They are a vast and complex field of study in computer science. In this course, the focus is particularly upon distributed systems wrt data distribution and processing.

The course aims at familiarizing the students with the concepts of Distributed Data Systems which includes topics like

1. Distributed Databases
2. Distributed File Systems
3. Data on the Web with Web serving as a distributed data repository
4. Data Exchange using XML, query languages and hierarchical data models for semi-structured/unstructured data
5. Pervasive Data distribution and access for embedded computing devices and sensory devices

The objectives of this course are as follows:

1. To gain an understanding of how data distribution is planned, designed and implemented.
2. To understand challenges in distributed database query processing, transaction processing and concurrency control.
3. To be able to understand the working of distributed file systems.
4. To gain knowledge on semi-structured data model in the context of XML.
5. To gain knowledge about new paradigms of web and pervasive data systems.
6. To gain knowledge in design and implementation of distributed data systems in the context of relational, semi-structured and unstructured data models.
7. To gain hands on experience in practical application of distributed data systems

Textbooks:

T1: M. Tamer Ozsu and Patrick Valduriez. ***Principles of Distributed Database Systems,*** Second Edition

Reference books:

R1: Ramez Elmasri and Shamkant B. Navathe. ***Fundamentals of database systems***, Sixth edition
R2: George Coulouris, Jean Dollimore, Tim Kindberg and Gordon Blair. ***Distributed Systems Concepts and Design*** , Fifth edition
R3: M. van Steen and A.S. Tanenbaum. ***Distributed Systems***, Third edition

Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book*
1-6	To understand the need and fundamentals of Distributed Data Systems (DDS).	Introduction to DDS, challenges and problem areas	R2-Ch.1 R3-Ch.1 & 2
	To have a recap of the concepts related to Database Systems.	Overview of RDBMS	T1-Ch.2
	To understand the concepts related to Networking in the context of DDS which would help in designing better DDSs.	Review of computer networks (in the DDS context)	T1-Ch.3
7-9	To have a good understanding of Distributed DBMS Architecture and be able to design a Distributed Database by applying the concepts learnt.	Distributed DBMS architecture, DDS design	T1-Ch.1, 4 & 5 R1-Ch.23
10-12	To be able to understand Query processing issues in DDS and perform data allocation and query optimization strategies.	DDS query processing, query decomposition, data allocation and optimization	T1-Ch.7 - 9
13-18	To understand the challenges in Transaction management and Concurrency control in DDS and be able to design schemes to suite the requirements.	Transaction management and concurrency control in DDS	T1-Ch.10 & 11
19-24	To get an overview of various concepts related to Distributed File Systems.	Distributed file systems – architecture, replication and caching	R2-Ch.12
25-30	To understand and work with semi-structured data model in the context of XML.	XML data model, schema definition, querying XML data	R1-Ch.13
31-36	To understand the concepts in Information retrieval which encompasses topics like retrieval models, querying, indexing and web search techniques.	Information retrieval – process, querying, indexing, and searching	R1-Ch.27
37-42	To understand the needs and challenges of Mobile Databases in portable devices	Introduction to mobile data management	T1- Ch. 16.5

* There will be additional research paper readings for each of the topics and more information will be disseminated during the course.

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid-semester exam	1.5 Hrs	20%	30.09.19 3:30 to 5:00 PM	Closed Book
Lab Assignments		20%	To be announced	Open Book
Research presentation and summary		20%	To be announced	Open Book
Comprehensive exam	3 Hrs	40%	05.12.19 AN	Closed Book

Make-up-Policy:

- No Make-up requests for lab test and research presentation will be catered to.
- Prior permission of the Instructor-in-Charge is required to get make-up for the mid-semester exam. Only on producing documentary proof of absence, proving that student would be physically unable to appear for the exam, the decision of granting the make-up will be taken.
- Prior permission of Dean, AUGSD is required to get make-up for the comprehensive exam.
- Instructor-in-charge's/Dean's decision in the matter of granting make-up would be final.

Course Notices:
All notices pertaining to this course will be displayed on the CSIS Notice Board and/or CMS Course webpage.

Chamber Consultation:
H-126, Friday 12:00pm to 1:00pm

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable. Students who are guilty of using unfair means will be reported for disciplinary action.

INSTRUCTOR-IN-CHARGE
CS G554