

CS623 Database management systems

Instructor

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- PhD from France - 1999
Research: Automated deduction and theorem proving, Verification of hardware and software, Data mining, New technologies in education,
- French accent.
- Teaching in France, in Cambodia, in USA (State University of New York at Stony Brook).
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Prerequisites

- What do you know (background, operating systems, software, DBMS ...)?
Oracle, SQL, JDBC, XML, PostgreSQL...
- High-level language programming
 - JAVA
- Data structures and algorithms
 - Trees, pointers, searching, sorting
- Discrete mathematical structures
 - Sets, relations, graphs
- Formal logic
 - Propositional logic, truth table, predicates

What is cs623?

- **Course description:** CS623 looks at the design of database management systems to obtain consistency, integrity and availability of data and at conceptual models and schemas of data: relational, hierarchical and network. It also discusses transaction processing systems. Topics covered include models of transactions, architectures of transaction processing systems and concurrent transactions.

Students undertake a semester project that includes the design and implementation of a database system and of transactions.

- **Goals:** By the end of this course, students will be able to design and implement a database system and will have some practice using JDBC to implement a set of transactions. They will also develop independent learning skills and will be aware of the research going on in databases.
- **Tools:** Oracle, SQL, JDBC, XML.

Description

- <http://www.csis.pace.edu/~scharff/cs623>
- Everything is/will be on the web.
- Class time
- Office Hours - When? Where?
- Textbooks
- Assignments
 - Homeworks
 - Project
 - Research paper
 - Exam
- Grades
- Academic integrity
- Guidelines for assignments

Research

- Hierarchical, network and object oriented models of data (February 12)
- PostgreSQL (February 12)
- XML
- Client Server
- Data mining
- Datawarehouse
- Internet and databases
- CORBA
- UML
- Distributed databases ...

Schedule

- **January 22** - Presentation - Overview of databases and transactions (Chapter 1 and 2)
- **January 29** - The entity relationship model (chapter 5)
- **February 5** - Relational data model (chapter 4)
- **February 12** - Relational algebra and SQL (chapter 6)
- **February 19** - Advanced SQL (chapter 6)
Subjects of research papers due (subject, abstract and list of references)
- **February 26** - Relational normalization theory (chapter 8)
- **March 5** - SQL in the real world (JDBC) (chapter 10)
- **March 12** - (No class - Semester break)
- **March 19** - Advanced topics in databases (chapter 16, 17, 18, 19)

Research papers due and last research presentations

- **March 26** - Physical data organization and indexing (chapter 9)
- **April 2** - Models of transactions (chapter 21)
- **April 9** - Architectures of transaction processing systems (chapter 22)
- **April 16** - Security and Internet protocols (chapter 27)
- **April 23** - Presentations and demonstrations of the projects (Last day of class)
- **April 30** - Last presentations and review