Database Systems: Concepts, design, and implementation

ISE 382 (3 Units)

Spring 2012

Description Concepts in modeling data for industry applications. Designing and implementing robust databases. Querying databases to extract business intelligence; Role of databases in Enterprise Resource Planning

Obectives To prepare students to model and build databases. Upon completion of the course, student will be able to:

- Model data using Entity-Relationship model
- Perform Normalization to Boyce-Codd Normal Form
- Design real world databases
- Use Structured Query Language (SQL) to build and query databases
- Demonstrate effective use of
  - Microsoft Access
  - Oracle Database
  - MySQL
- Explain how database transactions are controlled (concurrency) in multiuser environments
- Describe the importance of Business Intelligence: Reporting and data mining
- Show how database are used in ERP systems

Instructor Nitin Kalé
Information Technology Program (ITP) and Epstein Department of Industrial and Systems Engineering (ISE)

Contact Information kale@usc.edu | 213.740.7083 | OHE 412

Office Hours 11:30 -12:30 M | 10:30-12:30 T | 2:30-4:30 W

Lecture 2 – 4:50 Tuesday | KAP 160

Discussion (choose one) 2 – 3:20 Th | KAP 267
9:30 – 10:50 F | KAP 267

Teaching Assistant TBA

Grader TBA

Textbook Database Systems: Design, Implementation, and Management, 10th Edition, *Carlos Coronel*, ISBN: 9781111969608

Software Several software tools will be used in this class. All software will be available in the discussion lab KAP 267. Applications will also be available remotely (via a virtual lab) or for free download.

- Microsoft Excel 2010
- Microsoft Word 2010
- Microsoft Visio 2010
- Microsoft Access 2010
- Oracle Database 10g Express Edition
- MySQL
- SAP GUI

Website blackboard.usc.edu

All lecture notes, assignments, news, announcements and grades will be posted on Blackboard. Students are expected to check Blackboard frequently. Students can customize their personal notification settings in Blackboard.

Grading The weight of graded material during the semester is listed below. ***No extra credit assignments will be offered.***

Homework	30%
Projects	15%
Midterm	25%
Final Exam	30%
Total	100%

Final letter grade is based strictly on total percentage earned. NO EXCEPTIONS!

Grading scale (percentage)	
A	*100-94*
A-	*94-90*
B+	*90-87*
B	*87-83*
B-	*83-80*
C+	*80-77*
C	*77-73*
C-	*73-70*
D+	*70-67*
D	*67-63*
D-	*63-60*
F	*60 or below*

Policies

- Assignments turned in after the deadline will automatically have 10 points per day deducted.

- No make-up exams (except for medical or family emergencies) will be offered nor will there be any changes made to the Final Exam schedule.

- Before logging off a computer, students must ensure that they have emailed or saved projects created during the class or lab session. Any work saved to the

computer will be erased after restarting the computer.

- Open Lab will be announced in the third week of classes. These open labs are held beginning the third week of classes through the last week of classes. Please contact your instructor for specific times and days for the current semester.

Academic Integrity

The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. It is often difficult to distinguish between a culpable act and inadvertent behavior resulting from the nervous tension accompanying examinations. When the professor determines that a violation has occurred, appropriate action, as determined by the instructor, will be taken.

Although working together is encouraged, all work claimed as yours must in fact be your own effort. Students who plagiarize the work of other students will receive zero points and possibly be referred to Student Judicial Affairs and Community Standards (SJACS).

The School of Engineering adheres to the University's policies and procedures governing academic integrity as described in SCampus. Students are expected to be aware of and to observe the academic integrity standards described in SCampus, and to expect those standards to be enforced in this course.

All students should read, understand, and abide by the University Student Conduct Code listed in SCampus, and available at:
http://www.usc.edu/student-affairs/SJACS/nonacademicreview.html

Students with Disabilities

Any Student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213)740-0776."

Policy on Religious Holidays

University policy grants students excused absences from class for observance of religious holy days. Students should contact instructor IN ADVANCE to request such an excused absence. The student will be given an opportunity to make up work missed because of religious observance.

Students are advised to scan their syllabi at the beginning of each course to detect potential conflicts with their religious observances. Please note that this applies only to the sort of holy day that necessitates absence from class and/or whose religious requirements clearly conflict with aspects of academic performance. Please refer to the Holy Days Calendar http://orl.usc.edu/religiouslife/holydays/

Database Systems: Concepts, design, and implementation

ISE 382 (3 Units)

Course Outline

Jan 10 - Introduction

- Brief history of databases and their role in information systems
- Different types of databases and their organizational context
- Survey of DBMS

Reading Assignment: *Chapter 1*

Jan 17 – Data Modeling

- Data Models
- Business Rules
- Relational and Entity-Relationship Modeling

Reading Assignment: *Chapters 2 and 3*

Jan 24 – Data Modeling contd.

- Entities, attributes, relationships
- Keys
- Minimum and maximum cardinality
- E-R model for modeling business situations

Reading Assignment: *Chapters 4*

Mar 31 –Entity-Relationship Models

- Degrees of relationships
- Weak Entities
- Subtypes and supertypes

Reading Assignment: *Chapter 5*

Feb 7 – Normalization

- Anomalies and the need for normalization
- Normal forms
- First, second, third, Boyce-Codd, Fourth normal form
- Denormalization

Reading Assignment: *Chapter 6*

Feb 14 – Structured Query Language

- Creating a database using MySQL
- DDL

- DML
- Constraints
- Indexes

Reading Assignment: *Chapter 7*

Feb 21 – SQL (contd)

- SELECT queries
- Querying multiple tables
- Difference between Sub query and join for querying multiple tables

Reading Assignment: *Chapter 8*

Feb 28 – SQL (contd)

- SQL Functions
- Grouping
- Procedural SQL

Mar 6 - Midterm Exam

Mar 13 – Spring Recess

Mar 20 – Multiuser databases

- Database transactions and their properties
- Concurrency and security
- Recovery strategies

Reading Assignment: *Chapter 10*

Mar 27 – Web Environment

- Web database processing environment
- Database connectivity standards
- Client/Server architecture
- Mobility
- E-commerce

Reading Assignment: *Chapter 14*

Apr 3 – Business Intelligence Systems

- Data warehouses and data marts
- Business reporting and intelligence
- Data mining

Reading Assignment: *Chapter 13*

April 10 – Distributed database management systems

- Distributed processing
- Multi-site data and processing

Reading Assignment: *Chapter 12*

April 17 – Final Project

- Managing databases with Oracle
- Discussion of database design and implementation

April 24 – Enterprise Resource Planning

- ERP overview
- Global commerce and ERP
- Databases and ERP
- ERP in manufacturing
- Hands on SAP exercise

May 3rd - Final Exam, 2-4 pm, KAP 160