Database Systems: Concepts, design, and implementation
ISE 382 (3 Units)
Spring 2010

Description

Content
To prepare students to model and build databases and data-based systems with specific focus on
- Data modeling using Entity-Relationship model
- Normalization
- Database design
- Structured Query Language (SQL)
- Database design using Microsoft Access
- Database design using Microsoft SQL Server
- Database design using Oracle Database 10g
- Database design using MySQL
- Business Intelligence: Reporting and data mining
- Enterprise Resource Planning (ERP) systems and databases

Prerequisite
CSCI 101L (Basic understanding of a programming language)

Instructor
Nitin Kalé, Information Technology Program and Epstein Department of Industrial and Systems Engineering

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

Office Hours
10-12 Monday, 2-4 Wednesday

Lecture
2 – 3:50 Tuesday | KAP 160

Labs (choose one)
2 – 3:20 Th | KAP 267
9:30 – 10:50 F | OHE 540

Teaching Assistant
Qian An, qan@usc.edu

Grader
Jose Arche, jarche@usc.edu

Textbook
Software  Several software applications will be used in this class. All software will be available in the labs (KAP 267 and OHE 540). Some applications will also be available remotely or for free download.

- Microsoft Excel 2007
- Microsoft Word 2007
- Microsoft Visio 2007
- Microsoft Access 2007
- Microsoft SQL Server 2008 Express Edition
- Oracle Database 10g Express Edition
- Sun Microsystems 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 routinely.

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

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Projects</td>
<td>30%</td>
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<tr>
<td>Final Project</td>
<td>15%</td>
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<tr>
<td>Midterm</td>
<td>25%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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</tbody>
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Final letter grade is based strictly on total percentage earned. NO EXCEPTIONS!

Grading scale (percentage):

- A  100-95
- A-  95-92
- B+  92-89
- B   89-86
- B-  86-83
- C+  83-80
- C   80-77
- C-  77-74
- D+  74-71
- D   71-68
- D-  68-65
- F   64 or below

Policies  - Projects turned in after the deadline will automatically have 5 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.

- ITP is not responsible for any work lost.

- ITP offers Open Lab use for all students enrolled in ITP classes. These
  open labs are held beginning the second 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."
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Course Outline

Jan 12 - Introduction
- Brief history of information systems and databases
- Different types of databases and their organizational context
- Examples of DBMS

**Reading Assignment:** *Chapter 1*

Jan 19 – SQL
- Structured Query Language
- Querying a single table
- Querying multiple tables
- Sub queries and joins

**Reading Assignment:** *Chapter 2*

Jan 26 – Data Modeling
- Entity-Relationship Model
- Entities, attributes, relationships
- Keys

**Reading Assignment:** *Chapter 5*

Feb 2 – Data Modeling contd.
- E-R model for modeling business situations

**Reading Assignment:** *Chapter 5*

Feb 9 – Relational Model and Normalization
- Anomalies and the need for normalization
- Normal forms
- Designing updatable databases
- Common design problems
- First, second, third, Boyce-Codd, Fourth normal form

**Reading Assignment:** *Chapter 3,4*

Feb 16 – Database Design from Entity-Relationship Models
- Transform E-R data models into relational, DBMS-independent designs
- Creating Tables
- Creating relationships
- Minimum and maximum cardinality

**Reading Assignment:** Chapter 6

**Feb 23** – Database Design from Entity-Relationship Models contd.
- Creating a database using Microsoft SQL Server

**Reading Assignment:** Chapter 6, 10

**Mar 2** – SQL for database construction
- Sub query and join for querying multiple tables
- SQL DDL
- Embedding SQL in program code
- Coding triggers and stored procedures

**Reading Assignment:** Chapter 7

**Mar 9** - Midterm Exam

**Mar 16** – Spring Recess

**Mar 23**– Multiuser databases
- Database administration
- Concurrency and security
- Recovery strategies

**Reading Assignment:** Chapter 9

**Mar 30** – Database Management Systems
- Managing databases with Oracle

**Reading Assignment:** Chapter 10A

**April 6** – Web Server Environment
- Web database processing environment
- ODBC standard

**Reading Assignment:** Chapter 11

**April 13** – Business Intelligence Systems
- Data warehouses and data marts
- Business reporting and intelligence
- Data mining

**Reading Assignment:** Chapter 13

**April 20** – Final Project
- Discussion of database design and implementation
April 27 – Enterprise Resource Planning
- ERP overview
- Global commerce and ERP
- Databases and ERP
- ERP in manufacturing
- Hands on SAP exercise

Final Exam – 2 – 4 pm, Thursday, May 6th