IINF 202 Introduction to Data and Databases (Spring 2012)

Class Meets Times:  Tuesday 7:15 PM – 8:35 PM  
Thursday 7:15 PM – 8:35 PM  
Location: SS 134  
Instructor: Dima Kassab  
Email: dk155686@albany.edu  
Office Hours & Place: Thursday 2:00-4:00 PM, or by appointment, LI 86 or LI 84  
(Informatics Undergraduate Office)  
Teaching Assistant: Wanetta Rodney  
Email: wrodney@albany.edu  
Office Hours & Place: Tuesday and Thursday 12:00-1:00 PM, or by appointment, LI 86 or LI 84 (Informatics Undergraduate Office)

Catalog Description
This course will examine basic principles of data and databases, with an emphasis on relational database modeling. Topics such as database design, creation, and maintenance, user interface, and SQL queries will be presented from an end-user perspective.

A More Detailed Description
This is a hands-on course on data and databases that also emphasizes an understanding of the theory underlying relational databases as well as spreadsheets (flat file databases). The course deals with the analysis and design of databases as well as querying such databases to extract information needed by users.

By the end of the semester, you should be able to:

- Analyze simple, typical real-world situations where databases are used and build models of relational databases
- Design relational databases for simple real-world situations to avoid anomalies
- Formulate very simple queries in the structured query language (SQL)
- Use the software Microsoft Access in the modeling as well as design of relational databases for simple domains

Textbooks
Required:
Database Concepts (5th Edition), by David M. Kroenke and David Auer, Prentice Hall(2009), ISBN-10: 0-13-801880-4; ISBN-13: 978-013-801880-1. (KA in the Tentative Schedule below). We will study the first five chapters in great detail and they will be covered extensively in the examinations. We will cover chapter 6 (on Database administration) and chapter 7 (on Database processing applications) at a superficial level and their coverage in the examinations will reflect that. Extra readings will be provided throughout the semester via blackboard.
Grading

20% Homework/Labs/Pop-Quizzes
5% Participation
25% Midterm
25% Final Exam
25% Final Project

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100% Total

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Grading in the course will be relative. I’ll add your scores on the various components of the course and arrange the class in descending order of the total score in the course. The letter grades will reflect this ranking.

The lowest two grades in quizzes/homework/labs will be dropped to allow students flexibility to deal with sickness, job interviews, and other personal issues preventing them from attending some classes. Any other excuses for missing classes/assignments require permission from the undergraduate dean’s office.

Attendance

Attendance is essential for keeping up with the class. Students who miss classes or show up late will lose credit for quizzes/labs/homework missed.

Use of computers in class

The computers are to be used in the class only for the Access tutorials and for any work that the I might assign. Browsing the web or doing any personal work on the computers during the class time is not allowed. If found violating this rule, there will be a penalty of one quiz grade per instance.

Labs, Homework, Pop Quizzes, Midterm, Final Exam, Final Project

- **Labs:** The objective of the labs is to gain better understanding of the concepts explained in the class by using database/spreadsheet software. Many classes during the semester will be Labs where assignments will be given. They are due at the beginning of the following class.

- **Homework:** Occasionally, homework may be assigned, collected, and graded. The objective of the homework is to practice the concepts discussed in the class. Each homework will specify when they are due. Homework will be posted on blackboard.

- **Pop Quizzes:** Occasionally, there will be unannounced quizzes in the class. You are expected to have read and understood the concepts covered in the class.

- **Midterm and Final Exam:** These will be paper-based exams and will test the concepts and their applications as covered in the class. They will consist of problems, short cases, and some multiple choice problems. The parts of the course covered for each exam will be announced in the class at least one week prior to the exam date.

- **Final Project:** The objective of this project is to provide you an opportunity to apply the concepts studied during the semester in a real-world application. Details of the project will be provided during the semester.
• **Participation:** In addition to participating in class discussions, each student has to read an article and share its content with the class through a presentation. Presentations should be about 3-5 minutes at the beginning of the class. Each student has to do one article in the whole semester. Also, students have to work in groups of 5-6 students to write a short article (3-4 pages). The class wiki will be used for this purpose. The group has to select a topic to write about. Topics should be approved by the instructor.

**Final Project details**

For the final projects, students are required to follow the database analysis life cycle: database design, database study, implementation, testing and evaluation, operation, maintenance and evolution. Students are required to write their own scenarios, interview a potential customer, or find a scenario online or in a textbook and cite the source. Final projects will be handed in as four parts:

1. First draft: It includes the scenario and an outline of the final report.
2. Second draft: An updated version of your draft that includes in addition to 1, database design and study, and the entity relational model of your database.
3. Third draft: An updated version of your draft that includes in addition to 1 and 2, your physical database. Your physical database should include at least 20 tables. You should also create forms and queries to add and access data.
4. A final report that includes all of the above and discussions regarding testing and evaluation, operation, maintenance and evolution.

Students should work on this project as a group of 3-4 students. If time permits, we will dedicate few sessions throughout the semester where you can sit with your group members and work on the final project.

**Final Project Due Dates**

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Draft</td>
<td>Thursday, March 6th</td>
</tr>
<tr>
<td>Second Draft</td>
<td>Tuesday March 27th</td>
</tr>
<tr>
<td>Third Draft</td>
<td>Tuesday April 17th</td>
</tr>
<tr>
<td>Final Report</td>
<td>Tuesday May 1st</td>
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</tbody>
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**Academic Dishonesty, Reasonable accommodation in case of disabilities**

Any cases of plagiarism and academic dishonesty will be reported to the office of Judicial Affairs. Please read the University Undergraduate Bulletin for the policies. They will be followed rigidly. Please read and familiarize yourself with all the information on university policies at: [http://www.albany.edu/undergraduate/bulletin/regulations.html](http://www.albany.edu/undergraduate/bulletin/regulations.html)

Please notify the Director of Disabled Student Services (Campus Center 137, Phone: 442-5490) where appropriate. Reasonable accommodation will be provided for those students.
Tentative Schedule

WEEK 1 (TH: 1/19)
- Topics to be discussed: Types of Databases: Flat File, Hierarchical, Network, Relational, Object-Relational, Object. Importance of design and database anomalies. Components of a database system.
- Readings: KA: Ch.1.

WEEK 2 (T 1/24, TH: 1/26)
- Topics to be discussed: Components of a database system. Functions of a database application. Importance of database design and anomalies that can occur if it is not properly designed. Basics of the Microsoft Access database.
- Readings: KA: Ch. 1.

WEEK 3 (T: 1/31, TH: 2/2)
- Topics: Entities, Tables, Relations, Relationships, Attributes, Records, Fields, Tuples; Relation keys (candidate keys, primary keys, surrogate keys), Referential Integrity, Null values. Relational Design Principles. Functional Dependencies and Database Normalization. First, Second, Third, and Boyce-Codd Normal Forms.
- Readings: KA: Ch. 2.

WEEK 4 (T: 2/7, TH: 2/9)
- Topics: Entities, Tables, Relations, Relationships, Attributes, Records, Fields, Tuples; Relation keys (candidate keys, primary keys, surrogate keys), Referential Integrity, Null values. Relational Design Principles. Functional Dependencies and Database Normalization. First, Second, Third, and Boyce-Codd Normal Forms.
- Readings: KA: Ch. 2.

WEEK 5 (T: 2/14, TH: 2/16)
- Topics: Entities, Tables, Relations, Relationships, Attributes, Records, Fields, Tuples; Relation keys (candidate keys, primary keys, surrogate keys), Referential Integrity, Null values. Relational Design Principles. Functional Dependencies and Database Normalization. First, Second, Third, and Boyce-Codd Normal Forms.
- Readings: KA: Ch. 2.

- Guest Speaker: John Boucher

WEEK 6 (T: 2/21, TH: 2/23)
- Topics to be discussed: Entity-Relationship Modeling: Entities, Relationships, Attributes, Cardinalities (minimum and maximum), Crow’s foot notation, Database modeling in MS-Access.
- Readings: KA: Ch. 4, Ch. 5.

Review Session (T: 2/28)

Mid-Term Examination I (TH 3/1)

Week 7 (T: 3/6, TH: 3/8)
- Topics to be discussed: Entity-Relationship Modeling: Entities, Relationships, Attributes, Cardinalities (minimum and maximum), Crow’s foot notation, Database
modeling in MS-Access,
  • Readings: KA: Ch. 4, Ch. 5.

SPRING BREAK

WEEK 8 (T: 3/20, TH: 3/22)
  • Topics to be discussed: Entity-Relationship Modeling: Entities, Relationships, Attributes, Cardinalities (minimum and maximum), Crow’s foot notation, Database modeling in MS-Access,
  • Readings: KA: Ch. 4, Ch. 5.

WEEK 9 (T: 3/27, TH: 3/29)
  • Topics to be discussed: Data Definition Language (DDL): CREATE TABLE, Data Manipulation Language (DML): INSERT, SELECT, DELETE, DROP TABLE), database Joins, Joins with multiple tables, sub-queries, SQL views, ; SQL Datatypes, PRIMARY KEY, NOT NULL, NULL, UNIQUE, FOREIGN KEY, CHECK, CONSTRAINT, COUNT, SUM, AVG, MAX, MIN
  • Readings: KA: Ch. 3.

WEEK 10 (T: 4/3, TH: 4/5)
  • Topics to be discussed: Data Definition Language (DDL): CREATE TABLE, Data Manipulation Language (DML): INSERT, SELECT, DELETE, DROP TABLE), database Joins, Joins with multiple tables, sub-queries, SQL views, ; SQL Datatypes, PRIMARY KEY, NOT NULL, NULL, UNIQUE, FOREIGN KEY, CHECK, CONSTRAINT, COUNT, SUM, AVG, MAX, MIN
  • Readings: KA: Ch. 3.

WEEK 11 (T: 4/10, TH: 4/12)
  • Topics to be discussed: Data Definition Language (DDL): CREATE TABLE, Data Manipulation Language (DML): INSERT, SELECT, DELETE, DROP TABLE), database Joins, Joins with multiple tables, sub-queries, SQL views, ; SQL Datatypes, PRIMARY KEY, NOT NULL, NULL, UNIQUE, FOREIGN KEY, CHECK, CONSTRAINT, COUNT, SUM, AVG, MAX, MIN
  • Readings: KA: Ch. 3.

WEEK 12 (T: 4/19)
  • Topics to be discussed: Database Administration, concurrency control, database security, database backup and recovery, DBA responsibility.
  • Readings: KA: Ch. 6.

WEEK 13 (T: 4/20, TH: 4/22)
  • Topics to be discussed: Web database processing, XML, Forms, Reports.
  • Readings: KA: Ch. 7.

Review Session (T: 4/24)

Mid-Term Examination 2 (TH: 4/26)

WEEK 14 (T: 5/1, TH: 5/3)
WEEK 15 (T: 5/8)
GROUP PROJECT PRESENTATIONS