

**4002-360**

**Introduction to Database & Data Modeling  
Spring (20073) Course Syllabus**

**REMINDER:** The information presented in this syllabus is subject to expansion, change, or modification during the quarter.

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<b>Course Web Page:</b> <a href="http://www.jkang.com">http://www.jkang.com</a>	<b>We will also use a MyCourses conference</b>

**Course Text and Materials**

1. (REQUIRED) Fehily, Chris, *SQL* (Second edition), Peachpit Press, Berkeley CA, 2005.
2. (OPTIONAL) Kroenke, David M., *Database Concepts* (Third edition), Pearson Prentice-Hall, Upper Saddle River, NJ, 2008.

**Important RIT Deadlines**

**Last day of drop/add: March 17, 2008**

Last day to withdraw from the course with a “W”: May 2, 2008. The deadline for withdrawing from a course with a W grade is the end of the 6th week of the quarter. Forms may be obtained from your department office and need your instructor’s signature. The completed forms should be returned no later than May 2, 2008.

**NOTE:** IT department policy states that a student has one quarter to **challenge** any **grade**. After that, grades cannot be challenged.

**Course Description**

A presentation of the fundamental concepts used in data modeling and database implementation. The data modeling process, basic relational concepts, and the process of normalization, relational algebra, SQL, and guidelines for mapping a data model into a relational database will be covered. Students will model a multimedia and/or text-only problem and implement it on a single machine with a commercially available database package.

**Course Objectives**

General: Provide students with the foundation skill set required to work with relational databases as applied in the business and industry application domains. The skill set includes the ability to read and interpret a simple data model, normalization, and the implementation of a small relational database.

Specific: Upon successful completion of the course, a student should:

- Be able to read and interpret an entity-relationship (E-R) model diagram and map it into a relational model.
- Be able to apply the technique of normalization to a relational model that results in a set of normalized relations to the level of BCNF.
- Be able to map a relational model into a DBMS product through SQL DDL statements.
- Be able to query a relational database implemented with a DBMS product through SQL DML statements.

### **Prerequisites**

4002-218 or equivalent and 1016-206

### **Role of course in curriculum for:**

IT: This is an introductory database course required for all Information Technology students.

### **Course required for graduation in:**

#### **BS/IT**

##### Specific Program Outcome(s):

- Identify needs, analyze tasks, and develop profiles of users
- Program effectively within the student's specialty area
- Implement and query a relational database
- Participate effectively as a team member
- Be able to work effectively with the users of an organization
- Practice user centered design development and deployment

#### **BS/ANSA**

##### Specific Program Outcome(s):

(same as above)

### **Organization**

Exams: There will be two exams given during the quarter to assess the student's database knowledge and skills. Notes, textbooks, and calculators will not be allowed during these exams (unless special accommodations on record permit them). Exams may be composed of 2 parts.

Part I is a series of questions covering material discussed during class, from the reading, and lecture notes.

Part II is Practical exam where students are required to work with a DBMS and execute DDL, DML, and DCL SQL statements to address a given problem/scenario during live sessions in front of the course instructor(s).

Missing an exam will result in a grade of zero unless the student contacts the instructor at least 24 hours in advance of that exam. If the student's reason is valid (documentation may be required), the student will be allowed to take a different 'make-up' exam at a later time.

Exam I measures very fundamental skills and all students should do well on it. If a student does not do well, they may still continue in the course, but they should see their instructor to discuss their situation.

Exam II measures more advanced topics that are key to the student's understanding and success in future database courses.

Practice Exercises: Working with SQL is a skill and the only way to master a skill is with practice. Following every lecture there will be a Practice Exercise for the students to complete. The exercises are typically step-by-step assignments and will always be collected and graded. Frequently, these exercises will be completed fully during the class session. Sometimes, they will be due at the beginning of the next class session. Not handing in a Practice Exercise for any reason will result in a grade of zero for that Exercise. There are no make-ups for missing Practice Exercises.

Homework: Homework assignments will be assigned as an integral part of this course. This work is to be done outside of the usual class hours. Homework assignments will be assigned each week and are due the following week.

Homework will not be accepted more than 1 week after it is due. **Up to one week late you will get a maximum grade of 80%**. No homework assignments will be accepted after the last day of class.

Extra Credit Work: No extra credit assignments will be given so plan accordingly.

myCourses: All homework assignments, lecture notes, and other distributable course materials will be available via myCourses. Unless otherwise indicated, all student assignments and exams will be submitted via myCourses dropboxes.

### Course Outline

- 1 *Conceptual Foundation of the DBMS*
  - 1.1 Terminology
  - 1.2 DBMS components and basic architecture
- 2 *Conceptual Foundation of the Relational Model*
  - 2.1 Terminology
  - 2.2 Keys and Referential Integrity
  - 2.3 Functional Dependencies and normalization
- 3 *Data Modeling Techniques*
  - 3.1 The motivation for Data Modeling
  - 3.2 Basic E-R elements and components
  - 3.3 Basic relationships
  - 3.4 Reading and Interpreting an E-R diagram
- 4 *Relational Mapping and Normalization*
  - 4.1 Rules for representing E-R relationships with the relational model
  - 4.2 Constructing a relational model from an E-R diagram
- 5 *Relational Algebra review and SQL*
  - 5.1 General syntax rules
  - 5.2 SQL DDL statements
  - 5.3 Introduction to a DBMS product
  - 5.4 Using SQL DDL statements to create a DB
  - 5.5 SQL DML statements
  - 5.6 Using SQL DML statements to query a DB

**Grading**

The grading scale used along with the grading criteria is as follows:

Component	Weight
Practice Exercises	15%
Homework Projects	25%
Exam I	30%
Exam IIa	15%
Exam IIb	15%

Range	Grade
$\geq 90.0\%$	A
$\geq 80.0\% \ \& \ < 90\%$	B
$\geq 70.0\% \ \& \ < 80.0\%$	C
$\geq 60.0\% \ \& \ < 70.0\%$	D
$< 60.0\%$	F

**Proposed Schedule (Subject to change at any time)**

Day	Topic	Assigned Reading	Assignments
1	Intro	Kroenke Ch 1	HW 1
2	DB Development	Kroenke Ch 1 & 4	
3	Simple Tables	Fehily Ch 3, 4, 11 & 10	HW 2
4	Relations and Keys	Fehily Ch 2	
5	Constraints	Fehily Ch 2 , 10 & 11	HW 3
6	Normalization	Fehily Ch 2; Kroenke Ch 2	
7	Relationships	Fehily Ch 2; Kroenke Ch 4	HW 4
8	Many-Many Relationships & Joins	Fehily Ch 2 ; Kroenke Ch 4	
9	Review		
10	<b>EXAM I</b>		
11	Relational Algebra, Subqueries	Fehily Ch 8	HW 5
12	2-table Joins	Fehily Ch 7	
13	Multi-table Joins	Fehily Ch 7	HW 6
14	Advanced Attributes	Kroenke Ch 4	
15	Subtypes and Supertypes	Kroenke Ch 4	HW 7
16	Functions	Fehily Ch 5 & 6	
17	Advanced SQL Queries	Fehily Ch 11	
18	Advanced Database Design	Fehily Ch 11 & 14	
19	Review		
20	<b>Exam IIa</b>		
Finals Week	<b>EXAM IIb</b>		

**Cell Phones/Pagers:** Out of courtesy to the instructor and other students, all cell phones/pagers ringers should be turned off in class.

**Laboratory Computers:** Out of courtesy to the instructor and other students, laboratory PCs may be used prior to the beginning of class and for in-class exercises only. Students using the PCs at other times may be asked to leave the room.

**Notices of Accommodations:** If you have a “Notice of Accommodation”, you must provide your instructor with a copy of it within 1 week of starting this course.

**Academic Honesty Policy:** Please review the departmental policy on cheating as described at <http://www.it.rit.edu/dishonesty.php>

**Student Responsibilities:** Please review the general student responsibilities as outlined at <http://www.rit.edu/~301www/rr.php3>.

**Finally...**

Any or all of the previous information is subject to change or modification during the quarter.