Due Dates:
NOTE: Test 2 is on Thursday Oct. 24, 2013.
NOTE: Test 3 is on Tuesday Nov. 26, 2013.

In this project you will design and implement a database application. You will work in groups (teams). Each team will have two members. Each member should participate in ALL activities of the project: Design, implementation, and demonstration. The project is carried out in several main steps:

1. Conceptual design using the E-R model, Translation of the E-R model into the relational model.
2. Refinement of the design (into at least 3NF schemes, preferably BCNF or 4NF schemas).
3. Implementation: Creation of database tables, data entry, design and implementation of queries and transactions, and Web-based interface design.
4. Demonstration.

Your final report should contain (1) The final ER design, (2) The final relational design, including listing of all tables (schemas), keys, and data dependencies, (3) Data (current at demo time), (4) Queries and application programs. (5) You should also indicate, for each member of the group, which parts/tasks were implemented by that member.

Each team will demonstrate their project online. All members of the team should be present at the time of demonstration.

Your system should be easy to use. I should be able to check your project by going to the home page of your system.

THE PROBLEM:
A company is offering training courses. To make it easy, assume computer and programming courses, such as “intro to Java”, “intermediate Java”, “advanced Java”, “Ruby”, etc... Each course has

- A (unique) title
- zero or more prerequisites
- duration (1 to 3 days)
Courses are offered at different cities and at different dates. For simplicity, we restrict the cities to Greensboro, Winston Salem, Durham, and Raleigh. For example, “intro to Java” is offered in Greensboro on Sept. 30 and Oct. 16; in Durham on Oct. 8; and in Raleigh on Nov. 5. Each offering has a capacity. For example, the capacities for the above offerings are 10, 12, 10, and 20, respectively.

People can register for courses (provided they have the prerequisites) at different cities and different times. We would like to keep track of students names, addresses, emails, birth dates, companies, and company address. Upon completion of a course, the student is assigned a grade by the instructor. For simplicity, we assume grades are A, B, C, and F.

The training company offers a number of “certificates”. Each certificate consists of a set of courses, for example, “intermediate programmer” certificate consists of “intro to Java”, “intermediate Java”, and “Ruby” courses.

Your design should make it possible to keep track of courses and course offerings; students and courses they take and certificates they earn.

Some of the transactions and queries for this system are listed below. Most of the transactions and queries must be password protected.

**Administrators’ Transactions and queries**

1. Enter information for a new course.
2. Enter information for a course offering.
3. Assign a grade for a specific student in a specific course offering.
4. Determine certificates that a specific student has completed.
5. Display patient information (by office workers, doctors, and nurses).
6. Display prescribed medications for a given patient (by patient).

**Students’ Transactions and queries**

1. Enter student’s information.
2. Search for the offerings for a specific course.
3. Register for a course offering [system should verify that the course offering is not full].
4. Withdraw from a registered course [before the beginning of the course].
5. Search for all courses offered at a specific location.
6. List required courses for a specific certificate.
7. Determine remaining courses for a specific certificate and a specific student.

**Additional Transactions and queries**

1. Include a fee for each course.
2. Produce a bill for each student.