IS 475/675 - Database Design and Implementation Spring 2015 Course Syllabus

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Objectives

The purpose of this course is to enhance your knowledge of database design, creation, and implementation. This course combines conceptual knowledge of database management systems (DBMS) with practical, hands-on skills using Microsoft's SQL Server DBMS.

At the end of this course you will know or be able to do the following:

1. Design a database that is stable and understand why your design is stable. You will use the normalization process to facilitate database design.

2. Use entity-relationship diagrams (ERD's) to depict the design of a database. Use ERD's to communicate design concepts with both technical and non-technical people.

3. Implement a database using Microsoft's SQL Server DBMS with structured query language (SQL) to create, update, and access data in a database.

4. Identify the objectives and design goals of a transaction database versus a data warehouse.

5. Describe the general components of a database management system.

6. Describe the job activities that are the responsibilities of a database administrator.

There are many topics related to DBMS that we will not discuss in this class. For example, at the end of this course, you **will NOT** be able to:

♦ Install or administer an Enterprise SQL Server DBMS.

♦ Use or understand a NOSQL database.

♦ Evaluate the performance of a database.

♦ Fine-tune a database to enhance performance.

♦ Design a database that works in a non-relational environment, such as one relying on the map-reduce structure or a Hadoop database.

♦ Design and/or implement a data warehouse.

♦ Create triggers or complex stored procedures.

♦ Get a job immediately after the class as a database administrator of a sophisticated database management system.

Why should you spend your time on this course?

♦ *Because current business applications are built to integrate with a database management system.*

♦ *Because you will learn practical skills that will help you gain employment.*

♦ *Because database design is interesting, challenging and fun.*

♦ *Because the field pays well; the average salary for a database analyst is $74,344 and a database developer/modeler is $96,922 (Computerworld, 2014 Salary Survey: http://www.computerworld.com /spring/salary-survey/2014/job_level/3).*

Texts

Book 1: Hoffer, Jeffrey A., et al. Modern Database Management. **Tenth Edition (2011).** ISBN-13: 978-0-13-608839-4 or **Eleventh Edition** (2013): ISBN-13: 978-0132662253.

Book 2: Syverson, Bryan; Murach, Joel. SQL Server 2012 for Developers, Mike Murach & Associates, 2012, ISBN: 978-1890774691. This is a "trade" book, which means that it isn't published as a textbook for college students. Thus, there aren't many "pedagogical materials" such as end-of-chapter questions, summaries, and reviews. This is the kind of book you will be using to learn new technology throughout your career as an IS.

Software

We will use the Microsoft **SQL Server 2012** database management system (DBMS) to learn SQL, implement databases, and practice some basic database administration tasks. SQL Server 2012 is available in the COBA computing labs and from home using remote desktop connection. I recommend that you **do NOT install SQL Server Express** on your personal computer for this class.

SQL Server provides a number of tools that make it easier to manage the database environment. I prefer that you minimize the use of these tools. The purpose of using SQL as our only vehicle for communicating with the DBMS and avoiding "easy" tools is: (1) to learn SQL; (2) to better understand the commands that are frequently "hidden" by the use of wizards; and (3) to learn the basic similarities of all relational database management systems.

We will use **Microsoft Visio** to create and maintain data models. Visio is available in the COBA computer labs and as a free download for use at home.

What should you already know?

*While this is an introductory database class, it is **not** an introductory computer class. I assume that you already have exposure to computer information systems. The prerequisites for this course are IS 101, 201, 301, and 350. The presentation of these prerequisites means you:*

- *Have written programs in a language such as Visual Basic or C++ and are willing to and interested in learning a new programming language.*

- *Are familiar with a PC-based DBMS such as Microsoft's Access or MySQL..*

- *Have some exposure to determining the data requirements for a system from existing reports and forms.*

- *Understand how to read a simple entity-relationship diagram (ERD).*

- *Know the basic functions and objectives of a database management system.*

- *Understand the structure and format of a business report.*

If you do not have the skills listed above, or you have not taken the required prerequisites for this class, please drop this class and enroll in the prerequisites.

If you are unsure whether you are prepared for this class, please contact me immediately and I will help you determine whether you are prepared.

Grading

Your grade will be determined using the following distribution of points for the course deliverables:

450 points	8 Homework Assignments	45%
150 points	Design and Implementation Project	15%
200 points	First Exam	20%
200 points	Second Exam	20%

Your final grade is based on the results of your assignments, project, and exams. Your final grade for the class is based on the percentage of total points you have earned for all work completed during the semester. The final grade will not be rounded. The grade value assigned to each given percentage range is shown in the table below.

A	92% and above
A-	90-91%
B+	88% - 89%
B	82% - 87%
B-	80-81%
C+	78% - 79%
C	72% - 77%
C-	70-71%
D+	68% - 69%
D	62% - 67%
D-	60-61%
F	Below 60%

The assignments and projects require you to use skills learned in previous classes as well as in this class. These components involve designing, building, and implementing databases to satisfy **business application problems**. You may have to learn about a specific business application domain, such as some aspect of accounting, finance or marketing, to be able to complete the assignments and project.

The **homework assignments** help you learn the basics about how to design databases and program SQL. You may work alone or part of a team to complete the assignments. No more than four people are allowed to work together as a team on these assignments. If you work as part of a team, the team turns in a single set of deliverables for the team and each member of the team earns the same grade.

The **Design and Implementation Project** helps you learn about database design, ERD modeling, physical database design and the implementation of a database. This project requires you to create a logical design, produce a physical design for the database, create a prototype of the database using SQL Server, create a robust test dataset and write SQL queries. To receive initial design feedback, you will submit the initial database design. To help you keep to a schedule, you will turn in a secondary deliverable of a revised design and initial table creation before turning in the final project at the end of the semester. You may work as part of a team for the project.

There will be **two exams** given during the semester. The exams cover material gathered from your readings, projects, and class lectures. The first exam focuses on the SQL programming language, while the second exam emphasizes database design, normalization, and database administration. The first exam will be given in the computer lab.

The first exam is open notes, books, and web.

For the second exam, you may bring a page of notes (8.5" x 11"). It is OK to write on both sides of the page. It is OK to type the notes. It is OK to copy material and include it on the notes. It is OK to use a small font size. It is OK to hand write the notes. It is OK to include absolutely anything you want on your notes.

Course Policies

1. Learning is a collaborative effort.

The approach used for this course takes the view that the instructor and students work in a collaborative effort.

It is **my responsibility** to: Establish a framework and put together the materials we need to learn about this subject; create challenging projects; provide knowledge about the topic; present the material in a way understandable to students; provide guidance for database design and implementation activities; and give timely feedback concerning my opinion of your course deliverables.

It is **your responsibility** to work within the course framework and learn how to perform the activities involved in database design and implementation. I expect you to ask questions and communicate with me and your fellow class members in the classroom or via email. I expect you to read your texts, complete the projects, and arrive in class prepared to learn.

2. Keep track of assignments dates and complete all assignments on time.

Assignments are due during the first fifteen minutes of class on the assigned day**. No late assignments will be accepted without prior approval from the instructor.** Do not skip class and turn in your assignment after class; I will not accept the assignment.

I am happy to accept assignments early, or allow you to take an exam on an earlier date, if that will help you resolve a scheduling conflict.

Here are some other important university-related dates you should note:

01/29/15	Last day to add a class. Last day to change from audit to credit. Last day to get a refund if dropping an individual class. Last day to change from letter grade to S/U and vice versa.
03/31/15	Last day to drop a class. Last date to change from credit to audit.

3. Allocate time to learn the course material.

Past students have said that the work for this course takes about 8-10 hours a week. Please give yourself enough time to complete the assignments and learn the material.

4. Create a "team" rather than just working in a group.

You may choose your own team members and create a team via WebCampus. All team members receive the same grade for deliverables; I do not adjust the grade if a team member performs very well and other team members simply do nothing. Thus, you are responsible for creating an effective "team" environment. This includes: (1) selecting a team leader, (2) selecting an effective communication method (i.e. text, Facebook, email, phone); (3) dividing work among team members; (4) producing individual milestones, (5) having a backup plan in case a team member doesn't do what he/she said he/she would do, (6) monitoring compliance with milestones, and (7) managing team behavior.

You can elect to withdraw from a team, fire team members, and hire new team members. You are not "stuck" with the same team for the semester. All changes to the team must be done in a timely manner (not the day before an assignment is due). **All team members must be informed via email** of any changes to the team and you must cc: me on the email sent to the team. You cannot make changes to the team via WebCampus – you need to email me so that I can make the changes to the team structure on WebCampus.

5. Assistance is available in cases of disability.

If you have a disability and require assistance, please contact me or the Disability Resource Center (Thompson Building Suite 101) as soon as possible to arrange for appropriate accommodations.

6. Don't count on extra credit.

Rather than requesting extra credit assignments, focus on completing all assigned work to the best of your ability. There are multiple assignments and tests in this class providing ample opportunity with existing work to improve your grade. There may be occasional opportunities for extra credit, but these will only occur during in-class activities. For example, we may write SQL during class and I will offer extra credit to the first student able to solve a particular problem. There is **absolutely no** extra credit work available to be completed outside of class time.

7. A grade of "incomplete" is given only in emergencies.

The following paragraph is repeated from the UNR website:

> "An "I" is given when a student is performing passing work, but for reasons beyond the student's control is unable to complete the course requirements during the instructional period. Non-attendance, poor performance or requests to repeat the course are unacceptable reasons for issuance of the "I" mark."

8. You are responsible for knowing the material covered in class and in your texts.

I will be lecturing about material that goes beyond the content of your texts and I expect you to know this material for your exams. Any information discussed during class may be on an exam. Any information in the chapters assigned from the texts may be on an exam.

9. Don't cheat.

Cheating includes plagiarism, fraud and other forms of academic dishonesty. Examples of cheating include: If you give your work to another student to copy; if you give your work to another student to reference and that student turns in the work as his/her own; if you take the work of another student and turn it in as your own; if you work with or help another person outside your team and both teams (or individuals) turn in the same results; if you copy someone else's answers on an exam; and/or if you distribute an exam from a prior semester without my knowledge. These examples are not all encompassing, so try and avoid even the look of impropriety with your assignments and exams. Cheating will result in an "F" for an assignment and/or exam, or failure in the class, depending on the infraction.

Cases of academic dishonesty are viewed as a serious violation of the student code of conduct. All incidences will be reported to the Office of Student Judicial Affairs.

10. Being polite is a survival skill.

Be polite in class. People refer to the rules of correct behavior as "being polite." The rules of correct behavior differ depending upon the culture, country, and the situation (context). Since it can be difficult to figure out what it takes to "be polite" in any given situation, here are my key rules:

Be lively. I think database design and programming are fun topics and really hope you will, too. It is impolite to fall asleep, text, or be inattentive during class. Class attendance is not mandatory so don't come to class if you aren't awake and ready to learn.

Be prepared. We spend time in class reviewing the assignments and doing group work to reinforce the material in the assignments. Learning in this class requires that you have completed the assignments prior to class.

Don't be late. Please be on time for class so that we can make full use of our time without interruptions. If you must be late, please enter the room quietly and sit near the door. Class will start on time and stop on time.

Don't wander in and out of class. Don't leave during a class session unless you really need to

leave. For example, if you have an appointment that you absolutely MUST go to and need to leave class early, I understand. If you become ill during class, feel free to leave. Please do not walk in and out of class once class has started – for example walking out of class to get a soda and then returning to class is impolite.

Tell me when you are going to leave early. If you must leave a class early, and you can anticipate that need in advance, please tell me when you will be leaving. Please sit near the door and leave class quietly.

Manage your devices. Please make sure that all devices capable of making sounds are silent. Don't answer a call during class unless it is an emergency. If you must answer a call, please take it outside of class.

Be in the class when present. This class is for students who are fairly serious about gaining practical skills for future use. Again, attendance is not mandatory so use your time that you have decided to attend this class actually on the material required to learn database design and SQL programming. Don't text during class. If you use a computer during class, use it for class-related work. Don't surf, do Facebook, watch movies, play games, etc. Class isn't exciting every minute, but if you distract yourself with other input you will miss those times that actually are interesting and/or exciting.

Don't complain about a grade in class. I am happy to discuss **any** of your grades received on **any** of your assignments at **any** time during my office hours. You can also make an appointment, call me, or send email to discuss a grade. I prefer not to take the small amount of time allotted to the class as a whole to discuss your individual grade.