MSIS 5643 – Advanced Database Management Systems
Spring 2009

William S. Spears School of Business
Oklahoma State University

Instructor:

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Office Hours:	Tuesdays 2:00 – 3:30 and by appointment.
Class Time:	Tuesdays 4:30 – 7:20 p.m.
Course Site:	Desire2Learn (Online Classroom): http://oc.okstate.edu

Syllabus Attachment: http://osu.okstate.edu/acadaffr/aa/syllabusattachment-Spr.htm

Overview of the Course

The effective use of database technology in business and industry has become critical in today's global, competitive environment. Students completing this class should gain a solid understanding of database concepts, theoretical and applied, and should be prepared to work effectively in the database environments that are so prevalent in today's global business enterprises. They should have a substantive introduction to concepts data warehousing and web-enabled databases. Please recognize that I am attempting to make available to you considerable amounts of information that are reflective of today's database and data warehousing environments. Each of you will learn a basic set of this information and you may then learn an additional subset of the remaining material if it will help you. The exams will cover the basic set of the material, but not the extended material. I will let you know what will, and what will not, be covered.

Course Prerequisites

You should be a graduate student at OSU. **Additionally the ability to use Access, the Microsoft Office database management system, is something that you should have prior to taking this class. It will not be taught in this class.** You should have Internet access so that you can login to D2L and the virtual lab at OSU (http://virtuallab1.okstate.edu). We will also be using Visual Studio.Net and SQL Server 2005 available through virtual lab. You can also download Visual Studio through http://www.it.okstate.edu and install it on your own computer if you have one. I will also be dealing with some programming (VB.Net) so if you are taking this course as an elective and you are uncomfortable with this, you may consider dropping the class.

Course Goals

This course will introduce concepts and develop skills related to database design, implementation and management. In addition students will be exposed to advanced topics such as web-enabled databases and data warehousing.

Course Objectives

The objectives of this course are:

1) *to educate the student about today's relational database practices, approaches and issues;*
2) *to teach the student tools, methodologies, and skills for working successfully with databases in today's global, data-driven business models;*
3) *to give the student practice in applying some of these tools and skills through problems and exercises;*
4) *to give the student an opportunity to learn about web-enabled databases, and to implement this knowledge using ASP.Net; and*
5) *to provide the student with the opportunity to participate in a team-based database development project*

Texts and Supplementary Materials

Database Systems: A Practical Approach to Design, Implemention, and Management,by Thomas Connolly and Carolyn Begg, Fourth Edition; published by Addison-Wesley 2005, ISBN 0-321-21025-5.

Companion Web site:

www.booksites.net/connbegg (useful supplementary help here)

Grading Policy (tentative)

Midterm Exam	**175 Points**
Final Exam	**175 Points**
Homework	**150 Points**
Project Milestones	**125 Points**
Project	**50 Points**
Project Weekly Progress Reports	**25 Points**
TOTAL POINTS	**700 Points**

Final grades will be assigned according to the following percentages:

A	B	C	D	F
90 – 100	80 - 90	70 – 80	60-70	< 60

I (very rarely) may have some scaling at the end of the semester.

Description of Course Requirements

Exams The midterm and final exams will have problems/questions. There may be matching, multiple choice, fill-in-the-blank and/or short answer sections, and problems to work. (For example, an exam could contain 2 SQL problems, 20 matching questions, and 10 fill-in-the-blank questions.) I will give you some additional guidance as to exam content ahead of time. *All exams will be proctored.*

Homework Exercises At the end of many of the chapters covered in the Semester Schedule (shown below) a set of questions and/or exercises is provided. Answering and working some of these (the ones relevant to the lectures) will give you a good basis for studying for the question and problem sections of our exams. Some, but not all, will be assigned for homework.

The assigned problems will be under "Assignments" on D2L, and you can see the assignment, the requirements, and the due dates for each assignment. **You should submit your completed papers there by 11:55 p.m. on the due date. All assignments have to be professionally done using Microsoft Word**. I will be returning graded homework there as well; to see the graded paper you should download it and open it in Word. Select "Tools" from the menu and "Track Changes" from the drop-down box. You can use the "find" button to see the comments, which appear in red.

D2L will enforce the deadline on the due date, so if you have a late paper you will have to submit it through the Late Assignment option for that particular assignment because D2L will not allow you to submit late to the regular assignment location. The late assignment location for each assignment is also in the assignment section on D2L. **Please get your papers in to D2L on time. Late homework will be penalized 25% per day; they will not be accepted after 5 days.**

Please do not e-mail me any assignments. My e-mail load is such that I cannot handle it reliably. In all fairness to you, all assignments must come to me through the assignment feature of D2L.

Drops or Withdrawals and Special Accommodations for Students Please see the University Syllabus Attachment at http://osu.okstate.edu/acadaffr/aa/syllabusattachment-Spr.htm for this information.

Make-up Policy

Students are expected to take each exam on the date given and submit each assignment in a timely manner. If for any reason a student cannot attend an exam or submit an assignment, he or she must notify the instructor prior to the examination.

Term Project

You may do the term project by yourself or in a team with a **maximum of three** people. (If you choose to have a team, you should pick your partner(s) because I don't assign them.) All team-related problems are the teams' problems. I will not interfere, and don't expect me to arbitrate. If a team member does not contribute, fire him/her. If you don't like a team, quit that team and if you cannot find another team, work by yourself. I will assign one grade for the whole team

Each team is responsible for finding a business or real-world situation for which a database and to build associated user interfaces for data entry, queries and reports.

Your grade on this project has three parts.

(1) The first set of points (125 points) is assigned to the defined milestones that you need to accomplish. These points are associated with **completing the milestones satisfactorily and on time** and turning them in to the appropriate dropbox in D2L, and not with the product itself. **Only one milestone report per team should be submitted in the dropbox.**

(2) The second part is associated with the product itself. That is, these points reflect the success and quality of the final database system and your final report (50 points).

(3) The third part is associated with submitting weekly progress reports (25 points)

Milestones :

Below is a list of the milestones, or deliverables. **Due dates are shown in the time schedule** at the end of this syllabus. For example, in the time schedule where it says "MILESTONE #1 due Jan. 23", it is referring to 1) in the list of milestones below.

For each of these milestones, please **turn in the appropriate assignment** into the associated D2L dropbox, a report, summary, or notification as required. For the project activity reports, each member of the team will have to submit the report; it can be the same report for all members of the team. Each output is cumulatively added to your project documentation. That is, each milestone becomes a chapter in your system documentation. *So your system document grows with each milestone*.

(10 pts) 1) **Prepare a written project proposal:** this should be simple - a page or less - and should say what the company/organization is, who your main contact is, include a statement of the situation or problem, state what you intend to accomplish with your system, and give an idea of the information/output that will be generated by your system. Also, if you plan to work alone, then indicate on the proposal that you are alone. If you choose to be on a team, then organize it, choose a team name, and then include the first and last names of your members. I will then create a private discussion area for your team so that you can post information, etc. to your team members. I will go through the proposal and let you know whether it is reasonable or whether you should make some changes. *This is the beginning of your system document; submit it to the D2L dropbox.*

(10 pts.) 2) **Prepare a set of interview procedures/questions** – an approach to guide you when you conduct your first interview with your contact(s) (What is the problem that they want you to address? What questions do you need to ask in order to

construct a system? What output do they want? Set up a set of open-ended and/or short-answer questions to get the information you need.). *Add this section to your system document; submit it to the D2L dropbox.*

(10 pts.) 3) **Prepare a document with interview findings: Interview** at least one person involved in the business/organization to determine what the needs are and what outputs are generally needed in reports; **document the interview findings** and responses to the questions you asked (this is an interview report and simply summarizes the information you got from your interview; include the date and place of your interview, and the name(s) of the person (people) you spoke with) *Add this section to your system document; submit it to the D2L dropbox.*

(15 pts.) 4) **Prepare the Conceptual Database Design:** Prepare the conceptual DB design for the company based on needs as found through the interview. Include an EER diagram, a data dictionary of variable names and information. Document the transactions (Update & query transactions) needed to satisfy the data input and output reports requirements of your system. Validate your EER diagram by mapping these transactions on to your E-R diagram. *Add this section to your system document; submit it to the D2L dropbox.*

(15 pts.) 5) **Prepare the Logical Database Design:** Design the set of normalized tables. Explain why each of these is at least in BCNF. Prepare the SQL queries for all the data input and output transaction requirements that you identified in the previous milestone. *Add this section to your system document; submit it to the D2L dropbox.*

(20 pts.) 6) **Implement the Database Design in Microsoft Access & SQL Server 2005.** Implement the tables and relationships in Microsoft Access. Each table should contain at least 5 records. Also, write stored procedures to create the database tables and relationships in Microsoft SQL Server 2005 and to populate each table with 5 records (at least). Also, create stored procedures to backup and restore the database. Execute these stored procedures and test them. Prepare a document that contains the printout of the Microsoft Access tables, the relationship diagram from Microsoft Access and the stored procedures from SQL Server 2005. *Add this section to your system document; submit it to the D2L dropbox.*

(30 pts.) 7) **Design and construct web prototype of your system in ASP.Net.** Using Visual Studio.Net, design the web-based system that you can deliver to your client. The web based system will have a home page that contains links to an administrator page. Access to the administrator page is through a Login page. Any attempt to access the admin web page directly should also cause re-direction back to the log on page. The admin page should permit the administrator to create/backup/restore the database, add/modify/delete records in any table, to produce any administrator related reports, and to search the database. The home page will also have links to pages that let users enter data (all data has to be validated), and produce output reports identified in milestone 3.

(15 pts.) 8) **Prepare a short (but functional) user's manual** for your client (how to access your system; how to input and/or modify data; and what your system can produce and how your user should accomplish it. You might have a "trouble-shooting" section, if that makes sense for your project.). **Complete the web prototype** of

your system in the DBMS that your client can use (the system should be functional on a set of test data); The prototype should enable the user to enter *validated* data into the database tables, maintain the database through the administrator page, and produce the important documents and reports required by the client. **Complete the system document** *by adding two appendices to it. One containing the user manual and the other containing screenshots of your web prototype*; *submit it to the D2L dropbox.*
Deliver the prototype (with the interface) **and the User's Manual** to the person(s) you interviewed. (If the person wants to implement and use your database at a later time, they should be able to hire someone to input the data and have your system up and running); **post** to your private discussion area the date(s) that you do this and what your contact person(s) thought about it **Ask the person in the company/situation you work with send me an e-mail message to rathin.sarathy@okstate.edu or a memo on company letterhead** indicating that you gave them the system you developed.

Weekly reports: In addition to the milestones listed above, **I would like for you to submit a weekly progress report on your project.** This is the 25 points allocated to "Weekly Project Progress Reports." **Every member of the team has to report for the team's activities each week – it can be the same report if you like.** The progress report doesn't have to be long or involved – just tell me what stage you are on, what you have done this week, and how you are doing. *The report should be a single Microsoft Word file, it must be cumulative and must contain all the previous weeks' reports, with the current week's report first*. (Do NOT keep a spreadsheet and submit the spreadsheet the last week). You will not get credit unless you submit something each week. This progress report should be submitted by everyone every week in their respective dropboxes. No late progress reports will be accepted.

Please remember: Late assignments will be penalized 25% per day that it is overdue.

Tentative Schedule

Week	Topic - 1	Assignment	Term Project
(Before Jan. 13)	Go to http://oc.okstate.edu and, under "Students" in the left frame, choose D2L.This is our class infrastructure for assignments and class slides, etc.		Go to http://oc.okstate.edu and download the syllabus and be sure you can get in; if you cannot, let me know by email.
Jan. 13	**Lecture 1: File-Based Systems & The DB Environment** Book Chapters 1 & 2		
Jan. 20	**Lecture 2: The Relational Model, Algebra & Calculus** Book Chapters 3 & 4	Assignment 1 – **Due Jan. 26**	MILESTONE #1 (Project Proposal) **Due Date – Jan 23**
Jan. 27	**Lecture 3: SQL Data Manipulation & QBE** Book Chapters 5 & 7	Assignment 2 – **Due Feb. 2**	
Feb. 3	**Lecture 4: SQL Data Definition & working with SQL Server 2005** Book Chapter 6	Assignment 3 – **Due Feb. 9**	
Feb. 10	**Lecture 5: Database Design and Fact Finding Techniques** Book Chapters 9, 10 (selected coverage)	Assignment 4 – **Due Feb. 16**	MILESTONE #2 (Interview Questions) **Due Date – Feb. 20**
Feb. 17	**Lecture 6: Entity-Relationship Models:** Book Chapters 11 & 12 (selected coverage)	Assignment 5 – **Due Feb. 23**	
Feb. 24	**Lecture 7: Normalization** Book Chapters 13 & 14 (selected coverage)	Assignment 6 – **Due Mar. 2**	MILESTONE #3 (Interview Responses) **Due Date – Mar. 6**
Mar. 3	**Lecture 8: Conceptual & Logical DB Design** Book Chapters 15 & 16	Assignment 7 – **Due Mar. 9**	
Mar. 10	**Exam 1**		
Mar. 17	**SPRING BREAK**		
Mar. 24	**Lecture 9: Building ASP.Net Web Interfaces**		MILESTONES #4 (Conceptual DB Design) **Due Date – Mar. 27**
Mar. 31	**Lecture 9: Building ASP.Net Web Interfaces** (continued)		MILESTONES #5 (Logical DB Design) **Due Date – Apr. 3**
Apr. 7	**Lecture 10: Physical Database Design & Security -** Book Chapters 17, 18 & 19 – (selected coverage)		
Apr. 14	**Lecture 11: Physical Database Design – Transactions** Book Chapter 20 (selected coverage)		MILESTONE #6 (DB Implementation) **Due Date – Apr. 17**
Apr. 21	**Lecture 12: Physical Database Design – Query Processing** Book Chapter 21 (selected coverage)		
Apr. 28	**Lecture 13: Data Warehousing** Book Chapters 31, 32 & 33		MILESTONES #7 & #8 (Web prototype & final Documentation) **Due Date – May 4**
Final Examinations – May 5 – 6:00 to 7:50 p.m.			