

MSIT 542
Database Management, Fall 2006
Instructor: Robert Judge

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Textbook: Hoffer, Prescott, and McFadden. Modern Database Management. Seventh Edition. (Prentice Hall, 2005).

Optional Text: Peter Rob & Elie Semaan, Databases: Design, Development, & Deployment Using Microsoft Access. (McGraw-Hill, Irwin, 2000).

Why Two Texts??? – Hoffer et. al. is a complete coverage of DB Mgmt. focused on theory and independent of any DBMS. Rob et. al. addresses much of what we discuss but is focused around Microsoft Access.

Course Description: Introduction to relational database theory and practice for business managers. Development of skills needed to design, develop, and implement databases with insight to their maintenance, security and efficiency. Review of strategies for creating and managing data warehouses and data marts. Introduction to current techniques used in data mining and analysis.

Objectives:

- a. Develop understanding of relational database design, development and deployment concepts, tools and vocabulary
- b. Understand how databases are structures created to provide a means for companies to summarize, predict, identify and support business objectives
- c. Demonstrate basic skills with Microsoft Access and knowledge of:
 - i. Strengths and weaknesses
 - ii. When to use tool
 - iii. Alternate tools
- d. Understand implementation and integration strategy and issues
- e. Collaborate with other students to produce project report and presentations displaying knowledge and its use by integrating class concepts.

2. Weekly Class Agenda: 1) Concept/Vocabulary review, 2) Lecture on topic theory, 3) Hands-on walkthrough of relevant problem, 4) Student time to work on their project or a case (teams of 3-5). During class project time – I will be happy to review any additional homework problems you may select to do on your own.

3. Topics:

Week	Topic	Chapter (Hoffer ...)

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1 9/7	<p>Introduction to Database Development & Management</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1) What is Database Management and why is it so important to a company's competitive success? 2) Basic Concepts and definitions: <ol style="list-style-type: none"> a. Components of a database system b. Metadata c. File Processing vs. Database 3) Benefits and cost of Databases 4) Conceptual, Logical, Physical design (schema) 5) P.C. and larger Database systems (Access, MySQL, MS SQL, Oracle, SAP...) (Oracle PC and MySQL are free) 6) Overview of course syllabus 7) Quick overview of Access and Visio <p>Class Activities:</p> <ol style="list-style-type: none"> 1) Review Web Links <ol style="list-style-type: none"> a. Database News b. Access Forums c. O'Reilly Books d. Oracle DB lite (for PCs – Free) e. MySQL (Free) <p>For next week:</p> <ol style="list-style-type: none"> 1) Play with Visio – or similar flowcharting type SW you may have. Insert blocks, connect with arrows, type text in block. 2) Read Chapter 2 & 3 3) Start thinking of what you wish to do individual project on (see individual project in Project section below). 	1
2 9/14	<p>Modeling Data (ERDs)</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1) System development process and management overview 2) Schemas 3) Identifying business rules of an organization and how to capture them logically and visually 4) Rules for developing ERDs (Entity-Relationship-Diagram) 5) Symbols for ERDs 6) Vocabulary for ERDs <p>Class Activities:</p> <ol style="list-style-type: none"> 1) You as the analyst – what questions to ask? 2) Using Visio – create ERD for Problem 7, page 134 (H,P & M) <p>For next week: Read Chapter 4. Next week you become a database design consultant.</p>	2 & 3

Week	Topic	Chapter (Hoffer ...)
3 9/21	<p>Modeling Data (ERDs) – advanced concepts</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1) Generalized Hierarchies 2) Subtypes and Supertypes 3) Inheritance, specialization, disjointness, completeness, overlap, discriminators <p>Class Activities:</p> <ol style="list-style-type: none"> 1) You as the consultant: Business person (TBD) in need of database will present business rules and answer design questions. We will design, develop, and help deploy full solution during semester. 2) Create Project plan for design, development and deployment of Customer’s DB <p>For next week:</p> <ol style="list-style-type: none"> 1) report on 2 websites related to Modeling Databases and business rules (Case tools)– be prepared to present and discuss. 2) Homework: problem 16, page 178 3) Read Chapter 5 	4
4 & 5 9/28 & 10/5	<p>Logical Database Design</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1) Relations, tables, keys, constraints 2) Data structure in a relational model 3) Transformation into logical model 4) Normalization <p>Class Activities:</p> <ol style="list-style-type: none"> 1) Perform a ERD design review with customer 2) Customer DB: Define Schema for all Relations 3) Customer DB: Normalize 4) Create tables in Access using QBE and then using SQL statements <p>For next week:</p> <ol style="list-style-type: none"> 1) Homework (week 4): Problem 5, page 227. 2) Homework (week 5): Problem 14, page 231. 3) Read Chapter 6 	5
6 & 7 10/12 & 10/19	<p>Physical Database Design</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1) Goals of Physical Design 2) Denormalization 3) Data integrity, file organization, hashing, indexes, performance <p>Class Activities:</p>	6

Week	Topic	Chapter (Hoffer ...)
	1) Finish Customer DB physical design For next week: Prepare for Midterm	
8 10/26	Midterm Class Project time For next week: Read Chapter 7	20%
9 11/2	SQL Objectives: <ol style="list-style-type: none"> 1) DDL, DML, DCL 2) Create, Select, From, Where, Group by, Having, Order by 3) Queries 4) Integrity controls 5) Inserting, Updating and Deleting data 6) Storage efficiency 7) Expressions Class Activities: <ol style="list-style-type: none"> 1) Create customer DB Queries 2) Using forums to find solutions (Access Forums) For next week: <ol style="list-style-type: none"> 1) Homework: Problems 1,3, 4, 5, 6, 7, 8, 9 2) Read Chapter 8 	7 5 (Rob and Semaan)
10 11/9	Advanced SQL Objectives: <ol style="list-style-type: none"> 1) Joins 2) Views 3) Triggers and Routines 4) Rollbacks Class Activities: <ol style="list-style-type: none"> 3) Create customer DB Queries For next week: <ol style="list-style-type: none"> 1) Homework 1 – 25 (approx. 5 per student) 2) Read Chapter 6 in Rob and Semaan 	8
11 11/16	Forms Objectives: <ol style="list-style-type: none"> 1) Human interface 2) Consistent appearance 3) Security 4) Learn controls functions 5) Use Access Forms Wizard 6) Modify an existing Form Class Activities: <ol style="list-style-type: none"> 1) Customer DB forms 	6 (Rob and Semaan)

Week	Topic	Chapter (Hoffer ...)
	For next week: Read Chapter 7 in Rob and Semaan	
12 11/23	<p>Reports</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1) Same as above 2) Consistency with any output device 3) Use Access Report Wizard 4) Modify an existing Report <p>Class Activities:</p> <ol style="list-style-type: none"> 1) Perform Form and Report design review with customer 2) Customer DB reports 3) Finish and package customer DB <p>For next week: Read Chapter 10</p>	7 (Rob and Semaan)
13 11/30	<p>Databases and the Internet</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1) ASP.net and ADO.net 2) RSS 3) Security 4) Database Administration <p>Class Activities: Student project presentations</p> <p>For next week: Read Chapter 11</p>	9-10
14 12/7	<p>Data Warehouse, Data Marts, Data Mining</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1) Data warehousing 2) Data Mining 3) Bioinformatics 4) Knowledge Management Systems <p>Class Activities: Student project presentations</p> <p>For next week: Read Chapter 12</p>	11-12
15 12/14	FINAL (20%)	

Class Outline

- **Attendance**
 - Highly encouraged: class discussion and projects will reinforce material covered and address material not included in book. I will indicate key sections of chapters which can be ignored for class.
 - Read chapters prior to class, participation is encouraged.
 - Homework assignments not graded – will be responsible to be ready to present for class discussion.

- Be on time.
- All materials and the quizzes will be on WebCT. I highly recommend reviewing the posted material prior to class and making a copy to bring to class – it makes note taking much easier and effective.
- *** Participation may make the difference for students on a grade break border (i.e. the difference between a B+ and a A-)
- **Exams/quizzes**
 - There will be a Midterm and a Final. Each will represent approx. 20% of the grade in the class. The Final covers only material since the mid-term.
 - Mix of questions
 - Multiple choice/ True and False
 - Essay
 - Problem set-up
- **Project**
 - Class Project (20% of grade): Consult to business. Complete Design, Development, Forms and Reports. Possible deployment and Internet accessibility. Each student will have sole responsibility for at least one form or report as well as joint responsibility for design and development.
 - Individual Project (20% of grade): student will write a 10 page paper (double space, font 11 point) and prepare a 20-30 minute presentation on a related subject (to be approved by professor). Potential topics are: Security, Data Warehouses, OLAP, Data Mining, Database Admin tools, Knowledge Management Systems, XML and RSS, ASP.net and ADO.net.
- **Class Structure**
 - Lecture
 - Discussion/class projects/individual projects
 - Guest lectures by practitioners
- **Evaluation:** Grade based on total points – Curved relative to others in class

Item	Weight
Midterm	20%
Individual Project	20%
Class Project	20%
Final	20%
Involvement	10%