BU232
Business and Database Applications
[Onsite]

Course Description:

This course presents concepts and principles of database development and administration in relation to business applications. Focus is on data mining and analysis for business operations, and database development processes and administration.

Prerequisite(s) and/or Corequisite(s):

Prerequisites: BU131 Business and Information Systems

Credit hours: 4

Contact hours: 50 (30 Theory Hours, 20 Lab Hours)

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Instructor

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Office hours

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Class hours

I.   MAJOR INSTRUCTIONAL AREAS

- Relational database design

- The design process in business databases

- Other database design issues

- Data mining, migration, and analysis

- Database administration

II.   COURSE OBJECTIVES

1. Examine the early database models such as the hierarchical database model and the network database model.

2. Articulate the role and purpose of relational databases, and examine their advantages in relation to various business functions.

3. Explore why a professional should be concerned with database design, and state at least two benefits of applying good database design techniques.

4. Articulate the importance of completing the database design process thoroughly, and explain steps involved in designing a database.

5. Conduct an interview with the users of the business system, and define the mission statement and the mission objectives.

6. Analyze an existing database and suggest changes in its database design, using the ITT TECH Virtual Library.

7. Prepare a list of questions that you will ask for designing a new database from a developer's perspective, using the ITT TECH Virtual Library.

8. Compile the list of fields necessary to design a new database, given sample reports, and explain why each field is required and what relationships exist with other fields.

9. Define the preliminary table list, and explain the procedure for transforming the preliminary table list into the final table list.

10. Articulate the process of refining table structures, and examine the elements of the ideal field and the ideal table.

11. Identify the four main types of keys, and explain how table-level integrity is established through the use of a primary key, using the ITT TECH Virtual Library.

12. Define field specification for each field, and explain the anatomy of a field specification with the help of an example, using the ITT TECH Virtual Library.

13. Explain the three types of relationships that exist between tables, and identify the relationships that exist for the tables that appear in the final table list, using the ITT TECH Virtual Library.

14. Explain the different categories of business rules, and define and establish field-specific business rules, using the ITT TECH Virtual Library.

15. Explain the procedure of defining and establishing relationship specific to business rules, given a business scenario; for example, tracking customer's choices of certain products for a marketing research project.

16. Examine the purpose and structure of a validation table, and articulate the association between a business rule and a validation table, using the ITT TECH Virtual Library.

17. Examine how views are used, and explain the different types of views with the help of examples.

18. Review and refine data integrity of a database.

19. Contrast the relational database design with other design formats such as flat-file design and spreadsheet design.

20. Examine the two circumstances under which you may be compelled to depart from a proper database.

21. Design techniques and discuss alternate measures that can be employed to improve the processing performance of a database.

22. Use the ITT TECH Virtual Library to examine the use of databases in different types of information systems.

23. Compare your data analysis using spreadsheet software with the given data analysis from another software such as SPSS.

24. Accurately appraise the purpose, structure, and functions of transaction processing systems and examine how these systems have benefited businesses.

25. Design a relational database, and document details about the data entities, the tables, the data elements, the relationships between the data entities, and the data flow.

RELATED SCANS OBJECTIVES:

1. Understand and interpret the components of the text material as it relates to the overall subject.

2. Receive, interpret, and respond to verbal messages presented.

3. Identify the problems of separate components that have their *own agendas needing to work together for the good of the whole.*

4. Research for other current, newsworthy examples of the case studies presented.

5. Demonstrate the ability to select and utilize traditional and electronic library sources to broaden scope of presented materials and to prepare projects.

6. Organize and process information learned to appreciate the separate components' viewpoints and learn how they can be integrated for the good of the whole.

7. Communicate effectively on each individual assignment and group project.

8. Participate cooperatively as a team member, teaching, learning from, respecting, and negotiating with diverse members making a contribution to team success.

9. Think creatively about supervision in the business world, considering the many aspects, factors, and real problems that could present themselves.

10. Create documents to illustrate points, both learned and inferred.

III.   STUDENT TEXT and SUPPLIES

Hernandez, Michael. <u>Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design, Second ed</u>. Boston, MA: Addison-Wesley, 2003.

IV.   EVALUATION

Quizzes are given at Instructor's discretion

Students should be prepared for class each week with the understanding quizzes can be given by the instructor at anytime during the class session.

Terminology Test

This test covers common terms used in Database design and development.

Class Assignments:

The course is designed for students to take an active role in class activities and discussion. Each discussion session or activity is designed to reinforce the lecture portion of each week and should be completed during the class session or as assigned homework.

Project: Database Design

One project is assigned to this course and it is broken down into 10 parts, starting with Week 2 and finishing with Week 11 with its presentation. Students will be assigned to small groups of four or five depending on class enrollment. Groups will work together during and outside of class to complete the type of database they wish to design and present for a final project using MS Access or other comparable database software.

Attendance and Participation:

Regular attendance and participation are essential for satisfactory progress in this course.

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CATEGORY	PERCENT
Assignments - Quizzes	20%
Terminology Test	5%
Lab Assignments	35%
Database Project	30%
Participation	10%
Total	100%

Final grades will be calculated from the percentages earned in class as follows:

A	90 - 100%	4.0
B+	85 - 89%	3.5
B	80 - 84%	3.0
C+	75 - 79%	2.5
C	70 - 74%	2.0
D+	65 - 69%	1.5

D	60 - 64%	1.0
F	<60%	0.0

V.   REFERENCES and RESOURCES

A. REQUIRED MATERIALS

Hernandez, Michael. <u>Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design, Second ed</u>. Boston, MA: Addison-Wesley, 2003.

B. ITT TECH VIRTUAL LIBRARY

http://www.library.itt-tech.edu

Log in to the ITT TECH Virtual Library to access online books, journals, and other reference resources selected to support ITT Tech curricula.

C. ITT TECH VIRTUAL LIBRARY Course Specific Web Links

http://www.oracle.com/database/index.html

http://www.corel.com

http://www.microsoft.com/sql/default.mspx

http://www.sas.com/software/sas9/

http://www.ibm.com/

D. REFERENCE BOOKS

Halpin, Terry. <u>Information Modeling and Relational Databases: From Conceptual Analysis to Logical Design.</u> San Francisco, CA: Morgan Kaufmann, 2001.

Harrington, Jan L. <u>Relational Database Design Clearly Explained, 2nd ed.</u> San Francisco, CA: Morgan Kaufmann, 2002.

Hoberman, Steve. <u>Data Modeler's Workbench: Tools and Techniques for Analysis and Design</u>. New York, NY: John Wiley & Sons, 2001.

Kimball, Ralph and Margi Ross. <u>The Data Warehouse Toolkit: The Complete Guide to Dimensional Modeling, 2nd ed.</u> New York, NY: John Wiley & Sons, 2002.

Kyte, Thomas. <u>Effective Oracle by Design (Osborne ORACLE Press Series)</u>. New York, NY: McGraw-Hill, 2003.

Mata-Toledo, Ramon A., and Pauline K. Cushman, <u>Schaum's Outline of Fundamentals of Relational Databases</u>. New York, NY: McGraw-Hill, 2000.

Petersen, John. <u>Absolute Beginner's Guide to Databases.</u> New York, NY: Que, 2002.

Silverston, Len. <u>The Data Model Resource Book, Vol.1: A Library of Universal Data Models for All Enterprises</u>. New York, NY: John Wiley & Sons, 2001.

Sklar, David and Adam Trachtenberg. <u>PHP Cookbook</u>. Australia: O'Reilly and Associates, 2002.

Utley, Craig. <u>SQL Server 2000 Web Application Developer's Guide</u>. New York, NY: McGraw-Hill, 2000.

Van Duyne, Douglas K., James A. Landay, and Jason I. Hong. <u>The Design of Sites: Patterns, Principles, and Processes for Crafting a Customer-Centered Web Experience</u>. Boston, MA: Addison-Wesley, 2002.

Von Halle, Barbara. <u>Business Rules Applied: Building Better Systems Using the Business Rules Approach</u>. New York, NY: John Wiley & Sons, 2001.

Welling, Luke and Laura Thomson. <u>PHP and MySQL Web Development, 2nd ed.</u> New York, NY: Sams, 2003.

Whitehorn, Mark and Bill Marklyn. <u>Inside Relational Databases</u>. New York, NY: Springer Verlag Pub, 2001.

Williams, Hugh E. and David Lane, <u>Web Database Applications with PHP and MySQL</u>. Australia: O'Reilly and Associates, 2002.

E. INTERNET RESOURCES

The following Web resources are appropriate for business and database systems:

Financial Times presents Your   Text

http://www.pearsoned.co.uk/Bookshop/results.asp

Check out helpful tips

Association of Database Developers

http://www.internetnewsbureau.com/archives/2003/aug03/add.html

Association of Shareware Professionals

http://www.asp-shareware.org/

For a fee

Internet World

http://www.internetworld.com/

Free Management Library

http://www.mapnp.org/library/

Cyber Atlas

www.cyberatlas.internet.com

Billed as the leading resource for Internet trends and stats.

F. OTHER ONLINE PERIODICALS AND REFERENCE SITES

The following online periodicals and library sites are appropriate for information about business and database systems:

Business Journals

www.bizjournals.com/

American Business Journals online

Information Today

www.infotoday.com/

Newspaper for users and producers of electronic information services

The Internet Public Library contains periodicals on various topics   at

http://www.ipl.org/

NJIT Library

http://www.library.njit.edu/mainpages/lib_database.cfm

Look for the WWW symbol to search links.

VI.   PROJECT

Project: Database Design

One project is assigned to this course. It is broken down into 10 parts, starting with Week 2 and finishing with Week 11 with its presentation. Students will be assigned to small groups of four or five depending on class enrollment. Groups will work together during and outside of class to complete the database project documentation and present it as a final project using MS Access or other comparable database software.

Project Description:

The project will begin during Week 2 with the instructor assigning students to project groups. Each week students will be given progressive assignments in designing a database. Each progressive step is designed to allow the student to learn to design a database properly. Students should make duplicate copies of each project step to refine during and outside of class for final project submittal. Final Project is to be presented with documentation and implemented using MS Access or comparable Database application software.

The project has specific criteria of goals to follow to achieve satisfactory completion. The final project must include the following components:

- Documented Mission Statement with Mission Objectives (2- 3 pages)

- Documented Refined Tables with Field Specifications
  and Established Keys (5 tables minimum and 1 validation table)

- Documented Table Relationships (worksheet and schematic drawings)

- Documented and Implemented Business Rules

- Documented and Implemented Views (3 queries minimum) and
  Implemented Reports (2 minimum)

- A completed Database for Presentation encompassing the above criteria
  using database application software.

VII.   NOTES TO THE STUDENT

Students should be proactive, reading ahead and being well prepared for class. Database development when using a step-by-step approach makes a complicated topic easier to comprehend.

VIII.   FINAL PROJECT OUTLINE

Project 1: Database Design

PREVIEW: PROJECT AT-A-GLANCE:

The project takes place over 10 Units, beginning with Week 2.

Week	Assignment/Activity	Reference Materials	Handouts

2	1. Project introduction 2. Develop the database mission statement and mission objectives	ITT TECH Virtual Library, the Internet and other resources	None
3	1. Field lists and Relationship lists 2. Assignment due: Mission Statement and Mission Objectives	ITT TECH Virtual Library, the Internet and other resources	None
4	1. Preliminary Table lists and Refined Table lists 2 Assignment due: Completed Field lists and Relationship lists	ITT TECH Virtual Library, the Internet and other resources	None
5	1. Keys and Field Specifications 2 Assignment due: Refined table lists	ITT TECH Virtual Library, the Internet and other resources	None
6	1. Preliminary Table relationships 2. Assignment due: Documented Refined Tables with Field specifications and Established Keys (Data Structures)	ITT TECH Virtual Library, the Internet and other resources	Addendum 6.4 from Week 6

7	1. Final table relationships	ITT TECH Virtual Library, the Internet and other resources	None
	2. Assignment due: Preliminary Table relationships		
8	1. Business Rules	ITT TECH Virtual Library, the Internet and other resources	None
	2. Assignment due: Final table relationships		
9	1. Views and Reports	ITT TECH Virtual Library, the Internet and other resources	None
	2. Assignment due: Business Rules		
10	Assignment due: Views and Reports	ITT TECH Virtual Library, the Internet and other resources	None
11	1. Submit Documentation and Presentation of Database		

COURSE OBJECTIVES:

25. Design a relational database, and document details about the data entities, the tables, the data elements, the relationships between the data entities, and the data flow.

ENABLING OBJECTIVES:

1. Define a Mission Statement and Mission Objectives for the database.

2. Define the Data Structures.

3. Define and implement Table Relationships.

4. Define and implement Business Rules.

5. Define and implement Views.

6. Implement the Database.

PROJECT EVALUATION TABLE

Mission Statement and Objectives	10%
Field and Relationship List	5%
Preliminary Table lists	5%
Refined Table list	5%
Refined Tables with Established Key and Field Specifications	15%
Table Relationships	10%
Business Rules	10%
View and Reports lists	10%
Final Class Mtg. Presentation	30%
Total	**100%**

Database Documentation Rubric

Skill	4	3	2	1
Organization Of Database Documentation	100% of the Documentation shows a clear understanding of the topic.	80% of the Documentation shows a clear understanding of the topic.	60% of the Documentation shows a clear understanding of the topic.	Less than 50% of the Documentation shows a clear understanding of the topic.
Define a Mission Statement and Mission Objectives (2- 3 pages)	100% of the Documentation shows a clear understanding of the topic.	80% of the Documentation shows a clear understanding of the topic.	60% of the Documentation shows a clear understanding of the topic.	Less than 50% of the Documentation shows a clear understanding of the topic.
Define the Data Structures (5 tables minimum and 1 validation table)	100% of the Documentation shows a clear understanding of the topic.	80% of the Documentation shows a clear understanding of the topic.	60% of the Documentation shows a clear understanding of the topic.	Less than 50% of the Documentation shows a clear understanding of the topic.
Define and implement Table Relationships (worksheet and schematic drawings)	100% of the Documentation shows a clear understanding of the topic.	80% of the Documentation shows a clear understanding of the topic.	60% of the Documentation shows a clear understanding of the topic.	Less than 50% of the Documentation shows a clear understanding of the topic.
Define and implement Business Rules	100% of the Documentation shows a clear understanding of the topic.	80% of the Documentation shows a clear understanding of the topic.	60% of the Documentation shows a clear understanding of the topic.	Less than 50% of the Documentation shows a clear understanding of the topic.
Define and	100% of the Documentation	80% of the Documentation	60% of the Documentation	Less than 50% of the

implement Views (3 queries minimum) and Reports (2 minimum)	shows a clear understanding of the topic.	shows a clear understanding of the topic.	shows a clear understanding of the topic.	Documentation shows a clear understanding of the topic.

P.2

Database Presentation Rubric

CATEGORY	4	3	2	1
Time-Limit	100% Presentation is 8-10 minutes long.	80% Presentation is 7 minutes long.	60% Presentation is 6 minutes long.	50% Presentation is less than 6 minutes OR more than 10 minutes.
Collaboration with Peers	100% Almost always listens to, shares with, and supports the efforts of others in the group. Tries to keep people working well together.	80% Usually listens to, shares with, and supports the efforts of others in the group. Does not cause "waves" in the group.	60% Often listens to, shares with, and supports the efforts of others in the group but sometimes is not a good team member.	50% Rarely listens to, shares with, and supports the efforts of others in the group. Often is not a good team member.
Preparedness	100% Students are completely prepared and have obviously rehearsed.	80% Students seem pretty prepared but might have needed a couple more rehearsals.	60% The students are somewhat prepared, but it is clear that rehearsal was lacking.	50% of Students do not seem at all prepared to present.
Content	100% Shows a full understanding of the topic.	80% Shows a good understanding of the topic.	60% Shows a good understanding of parts of the topic.	50% Does not seem to understand the topic very well.