**CSIS 304: Databases**

**Spring 2013**

**Professor: Yuri Boreisha**

Office Address: Bridges 160-B

Office Hours: M W F 1:20 – 3:00

T H 11:00 – 1:30

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**PREREQUISITES** CSIS 153

**CLASS HOURS** M W 3:00 – 4:15, CB200

**REQUIRED TEXTBOOK (MSUM bookstore)**

1. Carlos Coronel, Steve Morris, Peter Rob, *Database Systems: Design, Implementation, and Management, 10th Edition*, 2013, Course Technology, ISBN-13: 978-1-111-96960-8.

**WEB SITE**

<http://mnstate.ims.mnscu.edu> Desire2Learn (D2L)

**COURSE DESCRIPTION**

This course provides a solid and practical foundation for the design, implementation, and management of database systems. The relational database model, relational databases, and Structured Query Language (SQL) are discussed in all details.

# Course Objectives / Student learning Outcomes

* Demonstrate the knowledge on the main database concepts.
* Demonstrate the practical skills of the relational database design with UML and ER modeling.
* Demonstrate the practical skills to implement, access, and manage databases using Structured Query Language (SQL),
* Explain and discuss the main concepts of transaction management and concurrency control, performance tuning and query optimization.
* Explain the main issues related to distributed database management systems.
* Explain what a data warehouse is, how data for it are prepared, how it is implemented, and what online analytical processing (OLAP) is.
* Demonstrate the practical skill of Web database development.

**COURSE POLICIES AND PROCEDURES**

* Regular attendance is required. It is a very important means of acquiring knowledge and clarification. Office hours are not to replace the missing lectures.
* Students should read and study the assigned book chapters prior to lectures.
* Lectures are devoted to discussion of the concepts covered in the text, and hands-on exercises.
* The instructor reserves the right to change the schedule, requirements, projects and assignments. Changes (if any) are announced in the class and through the D2L news.
* All exams, tests and projects must be entirely your own work. Academic dishonesty will result in the ultimate ‘0’ grade for the corresponding exam/test/project, and/or failure of the course, and/or university disciplinary action.
* Students with disabilities who believe they may need an accommodation in this class are encouraged to contact Greg Toutges, Director of Disability Services at 477-4318 (Voice) or 1-800-627-3529 (MRS/TTY), Flora Frick 154 as soon as possible to ensure that accommodations are implemented in a timely fashion. Information regarding Disability Services is available at [http://web.mnstate.edu/disability/](http://web.mnstate.edu/disability/%20)

**SUBMISSION RULES**

* All required materials are provided and all submissions should be done through the D2L web site.
* Students should submit all requested projects by the specified due dates.
* Presentation of your work in the lab/office can be requested.
* **The late submissions are not graded**.

**GRADING**

Your grade will be determined as follows:

Concept Tests (5) 30%

Projects (15) 50%

Final Exam (comprehensive) 20%

Letter grades:

93-100: A (4.0); 90-92: A- (3.67);

86-89: B+ (3.33); 83-85: B (3.0); 80-82: B- (2.67);

76-79: C+ (2.33); 73-75: C (2.0); 70-72: C- (1.67);

66-69: D+ (1.33); 60-65: D (1.0);

<60: F

**COURSE OUTLINE**

* Database Concepts (20%)
  + Database systems
  + Database models
* Design Concepts (30%)
  + The relational database model
  + Entity Relationship (ER) modeling
  + Advanced data modeling
  + Normalization of database tables
* Advance Design and Implementation (25%)
  + Introduction to Structured Query Language (SQL)
  + Advanced SQL
  + Database design
* Advance Database Concepts (20%)
  + Transaction management and concurrency control
  + Database performance tuning and query optimization
  + Distributed database management systems
  + Business intelligence and data warehouses
* Databases and the Internet (3%)
  + Database connectivity and Web technologies
* Database Administration (2%)
  + Database administration and security

**COURSE OUTLINE**

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| **Topics** | **Chapter Readings** | **Tests & Projects** |
| **Week 1: Database Systems**  Course Syllabus | Chapter 1 | *Project 1* |
| **Week 2: Data Models** | Chapter 2 | *Project 2* |
| **Week 3: The Relational Database Model**  **W Concept Test** | Chapter 3 | *Project 3*  **Chapters**  **1, 2** |
| **Week 4: Entity Relationship (ER) Modeling** | Chapter 4 | *Project 4* |
| **Week 5: Advance Data Modeling** | Chapter 5 | *Project 5* |
| **Week 6: Normalization of Database Tables** | Chapter 6 | *Project 6* |
| **Week 7: Introduction to Structured Query Language**  **W Concept Test** | Chapter 7 | *Project 7*  **Chapters**  **3-6** |
| **Week 8: Introduction to Structured Query Language** | Chapter 7 | *Project* 8 |
| **Spring Break** |  |  |

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| **Week 9: Advanced SQL** | Chapter 8 | *Project 9* |
| **Week 10: Advanced SQL** | Chapter 8 | *Project 10* |
| **Week 11: Database Design**  **W Concept Test** | Chapter 9 | *Project 11*  **Chapters**  **7-9** |
| **Week 12: Database Design**  **Transaction Management and Concurrency Control** | Chapters  9, 10 | *Project 12* |
| **Week 13: Database Performance Tuning and Query Optimization**  **Distributed Database Management Systems** | Chapters  11, 12 | *Project 13* |
| **Week 14: Business Intelligence and Data Warehouses** | Chapter 13 | *Project 14* |
| **Week 15: Database Connectivity and Web Development**  **Database Administration and Security**  **W Concept Test** | Chapters  14, 15 | *Project 15*  **Chapters**  **10-13** |
| **Week 16: Review**  **M Concept Test** |  | **Chapters**  **14-15** |
| **Final Exam (May 9, 3:00 – 4:00, CB200)** |  | Selected chapters |

***Note:*** Projects cover the practical design and implementation database problems (MS Visio, MS Access, MySQL, MS SQL Server, etc.)