

# Syllabus

**Department:** Division of Library and Information Science

**Course Number and Title:** LIS 248 Database Modeling and Design

**Bulletin Description:** [25 words maximum]

The course introduces database applications, modeling and design for graduate students having different academic backgrounds. Database applications are information-based problems in an information system.

**Prerequisite(s):** None

**Co-requisite(s):** None

## Course Objectives:

As outcomes of the course, students will be able to:

1.0 Describe the fundamentals of database applications, including

- Semantic modeling terminology: entities, relationships, attributes, properties, and constraints
- The manner in which entities and relationships organize the semantics of an information-based problem
- Relational database terminology: relation, table, relational database, primary key, foreign key, data independence, schema, instance, tuple, row, column, and field
- Characteristics of poor database design.

2.0 Apply methods for designing databases, including

- Transforming data models into relational databases
- Constructing tables and SQL queries using the database platform MS Access

3.0 Analyze databases and specifications, including

- Identifying entities, relationships, and attributes from both problem descriptions and existing databases
- Deriving business rules, information requirements, and functional requirements of a proposed database from user interviews, existing systems, and documentation
- Converting queries expressed in narrative form into SQL

4.0 Create solutions to database application problems, including

- Constructing business rules and data models from both problem descriptions and existing databases
- Writing a requirements analysis document consisting of the following sections: executive summary, problem statement, product review, business rules, data model, information and functional requirements.

5.0 Describe the ethical considerations important to each community affected by a newly installed or redesigned database application.

**Program Goals and Outcomes:**

3A) Understand the principles involved and the developmental, descriptive, and evaluative skills needed in the organization, representation and retrieval of recorded knowledge and information resources.

3B) Demonstrate ability to organize recorded knowledge and information using the systems of cataloging, metadata, indexing, and classification standards and methods.

4A) Acquire, apply, analyze and assess information, communication, assistive, and other technological skills related to resources, service delivery, professionalism, efficacy, and cost-efficiency of current technologies and relevant technological improvements.

**Units of Instruction:**

Chapters in Watson	Units
1, 2	Information in Organizations
3,4 5, 6	Application Semantics: Entities and Relationships
7 (including Reference: Basic Structures)	Data Modeling
9	Relational Model
10	SQL
15	Organizational Intelligence Technologies

**Bibliography:**

Watson, R. T. (2005). *Data Management: Databases and Organizations* (5th ed.). Wiley.

Burleson, D. (1995). *Managing distributed databases: Building bridges between database islands*. Wiley.

Eeles, P., & Sims O. (1998). *Building business objects*. Wiley.

Ethier, K., & Houser, A. (2001). *XML weekend crash course*. New York, NY : Hungry Minds.

Gray, P., Kulkarni, K., & Paton, N. (1992). *Object-oriented databases: A semantic data model approach*.  
Prentice Hall.

Hoffer, J. A., Venkataraman, R., & Topi, H. (2010). *Modern database management* (10<sup>th</sup> ed.). Prentice Hall.

Inmon, W.H., & Hackathon, R. (1994). *Using the data warehouse*. Wiley.

Johnson, J. L. (1997). *Database: Models, languages, design*. Oxford University Press.

Kroenke, D., & Auer, D. (2010). *Database concepts* (5<sup>th</sup> ed.). Prentice Hall.

Lambert S., & Lambert, M. D. (2007). *Microsoft Office Access 2007 step by step*. Microsoft Press.

Mowbray, T., & Malveau, R. (1997). *CORBA design patterns*, Wiley.

Ramkrishnan, R., & Gehrke, J. (2003). *Database management systems* (3<sup>rd</sup> ed.). McGraw-Hill.

Silberschatz A., Korth, H., & Sudarshan, S. (2010). *Database system concepts* (6<sup>th</sup> ed.). McGraw-Hill.

Ullman, J., & Widom, J. (1997) *A First Course in Database Systems*, Prentice Hall.

**Instructional Time Requirements: 150 hours for 3 credits (10 hours per week for our 15 week semester)**

Asynchronous or synchronous Lecture  
Assigned weekly reading  
Weekly assignments (individual and group)  
Active participation in online discussions  
Research for semester-long projects (term papers, projects)  
Presentations (online or face to face)  
Academic Service-Learning projects (where appropriate)