

COURSE OUTLINE

Computer Science/Information Systems 185 (C-ID Number: ITIS 180) Database Management Systems (C-ID Title: Introduction to Database Management Systems)

I. Catalog Statement

CS/IS 185 covers basic database administration tasks and key concepts of data quality and data security. In addition to developing database applications, the course helps the students understand how large-scale packaged systems are highly dependent on the use of Database Management Systems (DBMSs). Building on the transactional database understanding, the course provides an introduction to data and information management technologies that provide decision support capabilities under the broad business intelligence umbrella.

Total Lecture Units: 3.0

Total Laboratory Units: 0.0

Total Course Units: 3.0

Total Lecture Hours: 48.0

Total Laboratory Hours: 0.0

Total Laboratory Hours To Be Arranged: 0.0

Total Faculty Contact Hours: 48.0

Recommended Preparation: CS/IS 101 or equivalent

II. Course Entry Expectations

Prior to enrolling in the course, the student should be able to:

- demonstrate the importance of the technology infrastructure in an organization; identify major hardware components of a computer system; explain how to evaluate hardware components and what to look for in acquiring computer hardware; understand the interdependence of hardware and software; compare open vs. proprietary platforms;
- describe distinctions between system software and application software; explain common functions of system software; identify types of application software; understand how to evaluate software when planning a system; compare open vs. proprietary software;
- explain ethical concerns associated with information systems including privacy, access, reliability, legal, ethical, and accuracy; identify types of computer crime; select, access, and use appropriate sources.

III. Course Exit Standards

Upon successful completion of the required coursework, the student will be able to:

- define the role of databases and database management systems in managing organizational data and information;
- describe the fundamentals of the basic file organization techniques;
- construct a relational database design using an industrial-strength database management system, including the principles of data type selection and indexing;
- use the data definition, data manipulation, and data control language components of Structured Query Language (SQL) in the context of one widely used implementation of the language;
- describe the role of databases and database management systems in the context of enterprise systems;
- list the key principles of data security and identify data security risk and violations in data management system design.

IV. Course Content

Total Faculty Contact Hours = 48.0

- A. Database approach **(2 hours)**
- B. Types of database management systems **(2 hours)**
- C. Basic file processing concepts **(2 hours)**
- D. Physical data storage concepts **(2 hours)**
- E. File organizations techniques **(2 hours)**
- F. Conceptual data model **(3 hours)**
 - 1. Entity-relationship model
 - 2. Object-oriented data model
 - 3. Specific modeling grammars
- G. Logical data model **(3 hours)**
 - 1. Hierarchical data model
 - 2. Network data model
 - 3. Relational data model
- H. Mapping conceptual schema to a relational schema **(3 hours)**
- I. Normalization **(3 hours)**
- J. Physical data model **(3 hours)**
 - 1. Indexing
 - 2. Data types
- K. Database languages **(3 hours)**
 - 1. SQL, Data Definition Language (DDL)
 - 2. Data Manipulation Language (DML)
 - 3. Data Control Language (DCL)
- L. Data and database administration **(2 hours)**
- M. Transaction processing **(2 hours)**
- N. Using a database management system from an application development environment **(3 hours)**

- O. Use of database management systems in an enterprise system context **(2 hours)**
- P. Data / information architecture **(2 hours)**
- Q. Data security management **(3 hours)**
 - 1. Basic data security principles
 - 2. Data security implementation
- R. Data quality management **(3 hours)**
 - 1. Data quality principles
 - 2. Data quality audits
 - 3. Data quality improvement
- S. Business intelligence **(3 hours)**
 - 1. On-line analytic processing
 - 2. Data warehousing
 - 3. Data mining
 - 4. Enterprise search

V. Methods of Instruction

The following methods of instruction may be used in the course:

- lecture;
- database examples;

VI. Out of Class Assignments

The following out of class assignments may be used in the course:

- problem-solving assignments (e.g. designing databases).

VII. Methods of Evaluation

The following methods of evaluation may be used in the course:

- midterm examinations
- quizzes;
- final examination;

VIII. Textbook(s)

Hernandez, Michael. *Database Design for Mere Mortals: A Hands-On Guide to Relational Database Design*. 3rd ed. Boston: Addison-Wesley, 2013. Print.
10th Grade Textbook Reading Level. ISBN: 978-0321884497

IX. Student Learning Outcomes

Upon successful completion of the required coursework, the student will be able to:

- differentiate between the types of databases and know what each is best used to accomplish;
- describe the types of problems presented by databases and the possible solutions;
- analyze and present a solution for a case study.