



University of Nicosia, Cyprus

Course Code COMP-302	Course Title Database Management Systems	ECTS Credits 6
Department Computer Science	Semester Fall, Spring	Prerequisites COMP-201, Junior standing
Type of Course Required	Field Computer Science	Language of Instruction English
Level of Course 1 st Cycle	Year of Study 3 rd	Lecturer(s) Vasso Stylianou
Mode of Delivery Face-to-face	Work Placement N/A	Co-requisites None

Objectives of the Course:

The main objectives of the course are:

- Examine databases, database management systems and their role in the organization.
- Follow historically the development of database management systems until present time.
- Analyze data models and data modeling techniques.
- Cover relational database design by converting a conceptual data model to a database schema.
- Explain normalization and use it to design normalized relational databases.
- Cover Structured Query Language's (SQL), data definition (DDL), data manipulation (DML), and data control (DCL) components.
- Introduce data and database administration functions.
- Examine on-line transaction processing (OLTP) and its role in the business environment.
- Introduce business intelligence to include on-line analytic processing (OLAP), data warehousing, data mining.

Learning Outcomes:

After the completion of the course students will be able to:

- Explain the role of databases and database management systems in managing organizational data and information.
- Follow the historical development of database management systems and logical data models.
- See the role of information requirements specification processes in the broader systems analysis and design context.
- Distinguish between the basic approaches to data modeling techniques (i.e. object-oriented data modeling, semantic data modeling, etc.)
- Use at least one conceptual data modeling technique (such as entity-relationship modeling) to capture the information requirements for an enterprise domain.
- Design high-quality relational databases.
- Explain the purpose and principles of normalizing a relational database

structure and design a normalized relational database.

- Implement a relational database design using an industrial database management system, including the principles of data type selection and indexing.
- Use the data definition, data manipulation, and data control language components of SQL in the context of one widely use implementation of the language.
- Perform simple database administration tasks.
- Understand the concept of database transaction and apply it appropriately to an application context.
- Identify the role of databases and database management systems in the context of enterprise systems.
- Identify the difference between on-line transaction processing (OLTP) and on-line analytic processing (OLAP), and the relationship between these concepts and business intelligence, data warehousing and data mining.

Course Contents:

- 1) Basic File Processing Concepts
- 2) Database Approach
- 3) Types of Database Management Systems
- 4) Conceptual Data Model
 - a) Entity-relationship model
 - b) Object-oriented data model
 - c) Specific modeling grammars
 - d) Semantic data modeling
- 5) Logical Data Model
 - a) Hierarchical data model
 - b) Network data model
 - c) Relational data model
 - Relations and relational structures
 - Relational database design
 - Mapping conceptual schema to a relational schema
 - Normalization
 - Anomalies
- 6) Physical Data Model
 - a) Indexing
 - b) Data types
- 7) Structured Query Language (SQL): DDL, DML, and DCL
- 8) Data and Database Administration
- 9) Data Views
 - a) Virtual views (i.e. declaring views, query views, etc.)
 - b) Modifying views (i.e. Triggers)
- 10) Transaction Processing
- 11) Business intelligence
 - a) On-line analytic processing
 - b) Data warehousing
 - c) Data mining

Learning Activities and Teaching Methods:

Lectures, Lab Sessions, CASE tools demonstrations, Exercises
--

Assessment Methods:

Project and other assignments, Midterm Exam, Final Exam

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
D. M. Kroenke	Database Processing; Fundamentals, Design, and Implementation, 10/e	Prentice Hall	2006	0-13-197104-2

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
V. Stylianou	InterLearning On-Line Teaching and Learning Material	Student Intranet	2009	
R. Elmasri, S. Navathe	Fundamentals of Database Systems, 5/e	Addison-Wesley	2007	978-0-321-36957-4
A. Silberschatz, H. F. Korth, S. Sudarshan	Database System Concepts, 5/e	McGraw-Hill	2006	0-07-295886-3