



Course Syllabus

Course Code	Course Title	ECTS Credits
COMP-402	Advanced Databases	6
Prerequisites	Department	Semester
COMP-302	Computer Science	Fall, Spring
Type of Course	Field	Language of Instruction
Elective	Computer Science	English
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	Prof. Philippos Pouyioutas	4 th
Mode of Delivery	Work Placement	Corequisites
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- Make students aware of the various database models (emphasis on post-relational models) and database systems.
- Provide students with deep knowledge for developing database applications and fundamental knowledge for developing web-based database applications.
- Cover in detail all aspects of the SQL language (including security, authorization, optimization, embedded SQL).
- Thoroughly discuss the object-oriented database model, standards and languages and compare this model with the relational model.
- Discuss Data Warehousing, OLAP, Data Mining, Web Technology and XML.
- Introduce state-of-the-art research in the area of databases.

Learning Outcomes:

After completion of the course students are expected to be able to:

1. Critically compare and evaluate database models and database systems.
2. Design and develop database applications using commercially available database systems.
3. Enhance and fine-tune database applications with regards to security, authorization optimization.
4. Develop web-based database applications at an intermediate level.

5. Critically assess post-relational database models and especially the object-relational database model, standards and languages.
6. Develop advanced queries using the SQL language.
7. Research in state-of-the-art areas in database systems.

Course Content:

1. Post-relational data models and database systems
2. Object DBMSs
 - A. Object-Oriented DBMSs – Concepts and Design
 - B. Object-Oriented DBMSs – Standards and Languages
 - C. Object-Relational DBMSs
3. Web and DBMSs
 - A. Web Technology and DBMSs
 - B. Semistructured Data and XML
4. Security and Administration
5. Professional, Legal, and Ethical Issues
6. Transaction Management
7. Query Processing
8. Commercial DBMSs: Access and Oracle
9. Business Intelligence Technologies
 - A. Data Warehousing Concepts
 - B. Data Warehousing Design
 - C. OLAP
 - D. Data Mining.

Learning Activities and Teaching Methods:

Lectures, Lab Presentations, Lab Tutorials, Practical Exercises and Assignments.

Assessment Methods:

Homework, Projects, Final Exam.

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Database Systems – A Practical Approach to Design, Implementation and Management, 5/e	Connonly, T.M., Begg, C.E. and Strachan, A.D.	Addison Wesley	2009	0321523067

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Oracle Database 11g PL/SQL Programming: Develop Robust, Database-Driven PL/SQL Applications	Michael McLaughlin	McGraw-Hill Osborne Oracle Press Series	2008	0071494456
Advanced Programming using Visual Basic 2008	Anita C. Millsbaugh, Julia Case Bradley	McGraw-Hill	2008	9780071310079
Beginning Microsoft SQL Server 2008 Programming	Robert Vieira	Wiley	2009	8126519754
Beginning VB 2008 Databases: From Novice to Professional	Vidya Vrat Agarwal, James Huddleston	Apress	2008	1590599470