COMPUTER ENGINEERING (LM55)

(Lecce - Università degli Studi)

Teaching DATABASE

GenCod A003129

Owner professor Mario Alessandro BOCHICCHIO

Teaching in italian DATABASE

Teaching DATABASE

SSD code ING-INF/05

Reference course COMPUTER ENGINEERING

Course type Laurea Magistrale

Credits 9.0

Teaching hours Ore-Attivita-frontale: 81.0

For enrolled in 2016/2017

Taught in 2017/2018

Course year 2

Language INGLESE

Curriculum PERCORSO COMUNE

Location Lecce

Semester Primo-Semestre

Exam type Orale

Assessment Voto-Finale

Course timetable https://easyroom.unisalento.it/Orario

BRIEF COURSE DESCRIPTION

The aim is to provide the basics about the main database theories, techniques and tools to design / implement databases and database applications.

Topics:

- Database, relational databases, NoSQL and NewSQL;
- DataBase Management Systems;
- Relational Model and Relational Algebra;
- SQL: data definition and manipulation;
- Basics of Human-Computer Interaction and interface design for DB;
- Architectural aspects: Clients, Servers, Peers, Devices, IoT, ...
- Big data, data lakes, data analytics, machine learning, AI;

REQUIREMENTS

Good knowledge of Object Oriented Languages (at least 1), techniques and tools. Elements of computer networks and Web technologies.

COURSE AIMS

Acquired skills

Students will be able to design and understand data models, to create and manage databases and to design and implement data-centric applications.

TEACHING METHODOLOGY

Teaching method

Frontal lessons and lectures, for theoretical aspects, will be followed by participatory learning sessions and hands-on sessions to reinforce the comprehension and to acquire the abilities relevant to the field of database design.

ASSESSMENT TYPE	**Students evaluation** ▪Written test: on all aspects covered by the program ▪Oral Test: 1. All theoretical aspects covered by the program 2. Presentation and discussion of a project
OTHER USEFUL INFORMATION	**Office Hours** By appointment; contact the instructor by email or at the end of class meetings.
FULL SYLLABUS	**Fundamental of Database Systems, Elmasri-Navathe: 7th edition** Chapters: - 1: Databases and Database Users - 2: Database System Concepts and Architecture - 3: Data Modeling Using the Entity–Relationship (ER) Model - 4: The Enhanced Entity–Relationship (EER) Model - 5: The Relational Data Model and Relational Database Constraints - 6: Basic SQL - 7: More SQL: Complex Queries, Triggers, Views, and Schema Modification - 8: The Relational Algebra and Relational Calculus 8.1: Unary Relational Operations: SELECT and PROJECT 8.2: Relational Algebra Operations from Set Theory 8.3: Binary Relational Operations: JOIN and DIVISION 8.4: Additional Relational Operations 8.5: Examples of Queries in Relational Algebra - 9: Relational Database Design by ER- and EER-to-Relational Mapping - 10: Introduction to SQL Programming Techniques - 11: Web Database Programming Using PHP - 12: Object and Object-Relational Databases - 14: Basics of Functional Dependencies and Normalization for Relational Databases 14.1: Informal Design Guidelines for Relation Schemas 14.2: Functional Dependencies 14.3: Normal Forms Based on Primary Keys 14.4: General Definitions of Second and Third Normal Forms 14.5: Boyce-Codd Normal Form - 16: Disk Storage, Basic File Structures, Hashing, and Modern Storage Architectures - 17: Indexing Structures for Files and Physical Database Design - 20: Introduction to Transaction Processing Concepts and Theory - 21: Concurrency Control Techniques - **Teaching material:** more concepts on requirement elicitation and database application design and implementation, multidimensional analisys, datawharehouse, big data, big data management, database security, database administration, NoSQL, NewSQL, distributed databases.
REFERENCE TEXT BOOKS	R. Elmasri, S. Navathe, Fundamental of Database Systems, 7a edizione, Pearson ed.