

COMPUTER ENGINEERING (LM55)

(Lecce - Università degli Studi)

Insegnamento DATABASE

GenCod A003129

Insegnamento DATABASE

Anno di corso 2

Insegnamento in inglese DATABASE

Lingua INGLESE

Settore disciplinare ING-INF/05

Percorso PERCORSO COMUNE

Corso di studi di riferimento
COMPUTER ENGINEERING

Docente Mario Alessandro BOCHICCHIO

Tipo corso di studi Laurea Magistrale

Sede Lecce

Crediti 9.0

Periodo Primo Semestre

Ripartizione oraria Ore Attività frontale: 81.0

Tipo esame Orale

Per immatricolati nel 2016/2017

Valutazione Voto Finale

Erogato nel 2017/2018

Orario dell'insegnamento

<https://easyroom.unisalento.it/Orario>

BREVE DESCRIZIONE DEL CORSO

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;

PREREQUISITI

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

OBIETTIVI FORMATIVI

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.

METODI DIDATTICI

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.

MODALITA' D'ESAME

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
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ALTRE INFORMAZIONI UTILI

Office Hours

By appointment; contact the instructor by email or at the end of class meetings.

PROGRAMMA ESTESO

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 analysis, datawarehouse, big data, big data management, database security, database administration, NoSQL, NewSQL, distributed databases.

TESTI DI RIFERIMENTO

R. Elmasri, S. Navathe, Fundamental of Database Systems, 7a edizione, Pearson ed.