



Databases and Information Systems

Grado en Ingeniería Informática

2019 - 2020

Code: 11548

ECTS: 6 credits (1'5 + 3 + 1'5)

ARA Group (English) 3E

Wednesdays and Fridays: 11:30 to 13:00
1E Building, Room 2.0

Laboratory:

Tuesday: 17:00 to 18:30 (Starting 17/9/19)
Lab. DSIC 04

Emilio Vivancos

Office: 228, 1F Building.

Attention hours: On demand by email: vivancos@dsic.upv.es

Learning outcomes

After completion of the course, the student will be able to deploy an **advanced use** and a **basic design** of **relational databases**, as a support of current information systems.

Specific objectives:

- Fundamentals of database technology
- Relational data model
- SQL (DML and DDL)
- Relational database design (ER through UML, logical design)
- Relational DBMS

Contents

Unit 1. Relational Databases

- 1.1. Fundamentals
- 1.2. The Relational Data Model
- 1.3. Interpretation of a Relational Database

Unit 2. SQL: Data Manipulation Language

- 2.1. DML: queries and data modification
- 2.2. DDL: Data Definition Language

2.3. SQL exercises (Lab)

Unit 3. Database Management Systems (DBMS)

- 3.1. ANSI/SPARC Architecture
- 3.2. Transactions, Integrity and Concurrency
- 3.3. Recovery and Security

Unit 4. Relational Database Design

- 4.1. Design Basics
- 4.2. Conceptual Design
- 4.3. Logical Design

4.4. A Case Study (Lab)

LAB SESSIONS
Starting on
September 17th

7 SQL sessions
Unit 2.3
+
3 Database Design
Sessions
Unit 4.4

Connections to other subjects

Previous:

(11547) “[Matemática discreta](#)”, Discrete Mathematics (1).

First order logic, quantifications

(11551) “[Estructuras de datos y algoritmos](#)”, Data structures and algorithms (2)

Data types

Simultaneous:

(11555) “[Ingeniería del Software](#)”, Software Engineering (3A)

UML diagrams, modelling, XML, persistence

Connections to other subjects

Subsequent:

(11612) “Tecnologías de Bases de Datos”, Database Technology (3B)

(11596) “Diseño y Gestión de Bases de Datos”, Database Design and Management (4)

(11588) “Sistemas de Almacenamiento y Recup. de Inf.”, Storage and Recovery Information Systems(3B)

(11598) “Gestión de las Tecnologías de la Información”, Information Technology Management (3B)

Evaluation

4 exams (P1 and P2 on the same day):

- **P1 exam (1 point):**
Short questions from Unit 1
There is a make-up exam for this assessment (C1)
- **P2 exam (2 points):**
SQL problems from Unit 2
- **P3 exam (3 points):**
SQL problems from Unit 2
- **P4 exam (4 points):**
Questions or/and problems from Units 3 and 4

There are make-up exams for:

- Unit 1: **R1** (1 points),
- Unit 2: **R2** (5 points)
- Unit 3 + Unit 4: **R3-4** (4 points)

Evaluation

Unit 1 mark = P1_mark (or R1 if the student takes the R1 make-up exam)

Unit 2 mark = $P2_mark + (5 - P2_mark)/3 * P3_mark$

(or R2 if the student takes the R2 make-up exam)

Units 3-4 mark = P4_mark

(or R3-4 if the student takes the R3-4 make-up exam)

Final mark = Unit_1_mark + Unit_2_mark + Unit_3-4_mark

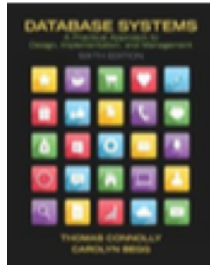
Evaluation

| P2_grade | P3_grade | Unit_2_grade |
|----------|----------|--------------|
| 0 | 0 | 0,00 |
| 0 | 0,5 | 0,83 |
| 0 | 1 | 1,67 |
| 0 | 1,5 | 2,50 |
| 0 | 2 | 3,33 |
| 0 | 2,5 | 4,17 |
| 0 | 3 | 5,00 |
| 0,5 | 0 | 0,50 |
| 0,5 | 0,5 | 1,25 |
| 0,5 | 1 | 2,00 |
| 0,5 | 1,5 | 2,75 |
| 0,5 | 2 | 3,50 |
| 0,5 | 2,5 | 4,25 |
| 0,5 | 3 | 5,00 |
| 1 | 0 | 1,00 |
| 1 | 0,5 | 1,67 |
| 1 | 1 | 2,33 |
| 1 | 1,5 | 3,00 |
| 1 | 2 | 3,67 |
| 1 | 2,5 | 4,33 |
| 1 | 3 | 5,00 |
| 1,5 | 0 | 1,50 |
| 1,5 | 0,5 | 2,08 |
| 1,5 | 1 | 2,67 |
| 1,5 | 1,5 | 3,25 |
| 1,5 | 2 | 3,83 |
| 1,5 | 2,5 | 4,42 |
| 1,5 | 3 | 5,00 |
| 2 | 0 | 2,00 |
| 2 | 0,5 | 2,50 |
| 2 | 1 | 3,00 |
| 2 | 1,5 | 3,50 |
| 2 | 2 | 4,00 |
| 2 | 2,5 | 4,50 |
| 2 | 3 | 5,00 |

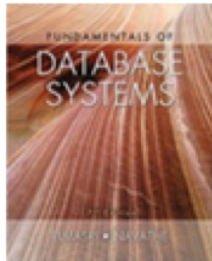
$$\text{Unit 2 grade} = \text{P2_mark} + (5 - \text{P2_mark})/3 * \text{P3_mark}$$

(or R2 if the student takes the R2 make-up exam)

Recommended Readings



- *Fundamentals of Database Systems*
Ramez **Elmasri**, Shamkant B. Navathe
Addison-Wesley (Pearson) 2015



- *Database Systems (6th Edition)*
Thomas M. **Connolly**, Carolyn E. Begg
Addison-Wesley 2014



- *Bases de datos relacionales*
Matilde **Celma** Giménez, Juan Carlos Casamayor
Ródenas , Laura Mota Herranz,
Pearson Prentice Hall, 2003