UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: DATABASES
Type: CORE COURSE
Degree: 407 - DEGREE PROGRAMME IN COMPUTER SCIENCE ENGINEERING
Center: 108 - SCHOOL OF COMPUTER SCIENCE OF C. REAL
Year: 2
Main language: English
Use of additional languages:
Web site: https://campusvirtual.uclm.es/

Code: 42319
ECTS credits: 6
Academic year: 2023-24
Group(s): 20 21 22
Duration: C2
Second language: Spanish
English Friendly: N
Bilingual: Y

Lecturer: JOSE ANTONIO CRUZ LEMUS - Group(s): **20**

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero/3.21	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN	+34926052329	joseantonio.cruz@uclm.es	https://esi.uclm.es/index.php/grado-en-ingenieria-informatica/profesorado/

Lecturer: DAVID GARCIA ROSADO - Group(s): **21**

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero/2.15	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN	+34926052105	david.grosado@uclm.es	https://esi.uclm.es/index.php/grado-en-ingenieria-informatica/profesorado/

Lecturer: MARCELA FABIANA GENERO BOCCO - Group(s): **21 22**

Building/Office	Department	Phone number	Email	Office hours
Fermin Caballero/3.25	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN	+34926052525	marcela.genero@uclm.es	https://esi.uclm.es/index.php/grado-en-ingenieria-informatica/profesorado/

Lecturer: JAVIER VERDUGO LARA - Group(s): **22**

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero/1.06	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN		Javier.Verdugo@uclm.es	

2. Pre-Requisites

Databases and database systems are a fundamental component in the daily life of modern society. Interactions with administration, public services, and businesses can hardly be understood without the management of a database that enables communication among different actors.

Currently, computer technology is incomprehensible without an underlying database that allows for achieving objectives. Technologies based on artificial intelligence, networks, web technologies, games, information systems, etc., would not be understood without the management of databases.

Therefore, database management systems are a crucial component in information and communication technologies. Without them, it would be impossible to imagine the social reach that the internet and communications have achieved in today's society.

3. Justification in the curriculum, relation to other subjects and to the profession

This course is integrated into the subject of Software Engineering, Information Systems and Intelligent Systems and serves as a basis for the following courses:

- Database Development.
- Advanced Databases.
- Administration of Databases.

4. Degree competences achieved in this course

Course competences

Code	Description
BA04	Basic knowledge about the uses and programming of computers, operating systems, data bases, and digital programmes with applications in engineering.
CO12	Knowledge and application of the features, functions, and structure of data bases so as to lead to an appropriate use, and the design, analysis, and implementation of application based on them.
CO13	Knowledge and application of the required tools for the storage, process, and access to informational systems, even web based ones.
INS01	Analysis, synthesis, and assessment skills.
INS03	Ability to manage information and data.
INS04	Problem solving skills by the application of engineering techniques.
INS05	Argumentative skills to logically justify and explain decisions and opinions.
PER01	Team work abilities.
SIS01	Critical thinking.
SIS03	Autonomous learning.
SIS04	Adaptation to new scenarios.
SIS05	Creativity.
SIS09	Care for quality.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Knowledge of the characteristics and structures of databases, as well as the functionalities of systems that manage them and the languages ¿¿for their consultation and manipulation.

Building of applications that use databases.

6. Units / Contents

Unit 1: Introduction to Databases
    Unit 1.1 DB & DB Management Systems concepts and origin.
    Unit 1.2 DB & DBMS evolution
    Unit 1.3 DB Architectures

Unit 2: Data Models
    Unit 2.1 Introduction to data modeling
    Unit 2.2 Conceptual, logical and physical modeling

Unit 3: Relational Model
    Unit 3.1 Introduction to Relational Model
    Unit 3.2 Structuring data with the RM
    Unit 3.3 RM operators
    Unit 3.4 Integrity rules
    Unit 3.5 Transforming E/R into RM

Unit 4: Structured Query Language
    Unit 4.1 Introduction to SQL
    Unit 4.2 Data Definition and Manipulation Languages in SQL
    Unit 4.3 Views in SQL

ADDITIONAL COMMENTS, REMARKS

Laboratory contents:

- Accessing databases via programs

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	BA04 CO12 CO13 SIS01 SIS09 UCLM02	0.72	18	N	-	Exposure of the syllabus by the teacher (MAG).
Individual tutoring sessions [ON-SITE]	Other Methodologies	BA04 CO12 CO13 UCLM02	0.18	4.5	N	-	Individual or small group tutorials in the teacher's office, classroom or laboratory (TUT).
Study and Exam Preparation [OFF-SITE]	Self-study	BA04 CO12 CO13 SIS01 SIS09 UCLM02	2.1	52.5	N	-	Individual study (EST).
Other off-site activity [OFF-SITE]	Practical or hands-on activities	BA04 CO12 CO13 INS03 INS04 INS05 PER01 SIS03 SIS04 SIS05 UCLM02	0.6	15	N	-	Preparation of laboratory practices (PLAB).
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA04 CO12 INS01 INS04 PER01 SIS03 SIS09	0.6	15	Y	N	Resolution of exercises by the teacher and students (PRO)
Writing of reports or projects [OFF-SITE]	Self-study	CO12 INS01 INS04 INS05 PER01 SIS03	0.9	22.5	Y	N	Preparation of a report on a topic proposed by the teacher (RES).
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	BA04 CO12 CO13 INS03 INS04 INS05 PER01 SIS03 SIS05 SIS09 UCLM02	0.6	15	Y	Y	Performance in the laboratory of the scheduled practices (LAB).
Mid-term test [ON-SITE]	Assessment tests	BA04 CO12 CO13 INS01 INS04 INS05 UCLM02	0.15	3.75	Y	Y	Partial test 1 of the first half of the syllabus of the subject (EVA)
Mid-term test [ON-SITE]	Assessment tests	BA04 CO12 CO13 INS01 INS04 INS05 UCLM02	0.15	3.75	Y	Y	Partial test 2 of the first half of the syllabus of the subject (EVA)
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4					**Total class time hours: 60**
		Total credits of out of class work: 3.6					**Total hours of out of class work: 90**

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Mid-term tests	20.00%	20.00%	Partial Test 2. Compulsory activity that can be retaken. To be carried out within the planned dates of the final exam call. The Partial Test 1 retake will be performed at this date only for

Theoretical papers assessment	15.00%	15.00%	Non-compulsory activity that can be retaken. To be carried out before end of teaching period
Laboratory sessions	25.00%	25.00%	Compulsory activity that can be retaken. To be carried out during lab sessions
Assessment of active participation	10.00%	0.00%	Non-compulsory activity that cannot be retaken (rescheduling). To be carried out in the theory/laboratory sessions for the students of the continuous modality.
Mid-term tests	30.00%	30.00%	Partial Test 1. Compulsory activity that can be retaken (rescheduling). To be carried out at the end of the first half of the teaching period (approx.) by the students in "continuous assessment mode". Students in "non-continuous evaluation" will perform this activity together with the Partial Test 2 in the planned date of the final exam call.
Total:	**100.00%**	**90.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. A compulsory activity cannot be divided into eliminatory parts, nor can minimum marks be established for each of its parts. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The partial tests will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the partial tests will be evaluated by the same lecturer for all the students.

A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake exam call (convocatoria extraordinaria). If an activity is not recoverable, its assessment will be preserved for the resit/retake exam call (convocatoria extraordinaria) even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The mark of the passed activities in any call, except for the partial tests, will be conserved for the subsequent academic year at the request of the student, provided that mark is equal or greater than 50% and that the activities and evaluation criteria of the subject remain unchanged prior to the beginning of that academic year.

The failure of a student to attend the partial 1 and partial 2 tests will automatically result in her/him receiving a "Failure to attend" (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

Non-continuous evaluation:

Students may apply at the beginning of the semester for the non-continuous assessment mode. In the same way, the student may change to the non-continuous evaluation mode as long as she/he has not participated during the teaching period in evaluable activities that together account for at least 50% of the total mark of the subject. If a student has reached this 50% of the total obtainable mark or the teaching period is over, she/he will be considered in continuous assessment without the possibility of changing to non-continuous evaluation mode.

Students who take the non-continuous evaluation mode will be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous evaluation".

In the "non-continuous evaluation" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

Specifications for the resit/retake exam:

Evaluation tests will be conducted for all recoverable activities. The failure of a student to attend the partial 1 and partial 2 tests will automatically result in her/him receiving a "Failure to attend" (no presentado), except in the case that the student conserves the mark for partial 1 and partial 2 from the final exam call (convocatoria ordinaria). In the latter case, the student's carrying out of any other evaluable activity in the resit/retake exam call (convocatoria extraordinaria) will result in a numerical mark.

Specifications for the second resit / retake exam:

Same characteristics as the resit/retake exam call.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	**hours**
Individual tutoring sessions [PRESENCIAL][Other Methodologies]	4.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	52.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	15
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Mid-term test [PRESENCIAL][Assessment tests]	3.75
Mid-term test [PRESENCIAL][Assessment tests]	3.75
General comments about the planning: The subject is taught in 3 x 1,5 hour sessions per week	
Unit 1 (de 4): Introduction to Databases	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Unit 2 (de 4): Data Models	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Unit 3 (de 4): Relational Model	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	4

Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	6
Unit 4 (de 4): Structured Query Language	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	8.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	9
Global activity	
Activities	**hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	18
Study and Exam Preparation [AUTÓNOMA][Self-study]	52.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	15
Individual tutoring sessions [PRESENCIAL][Other Methodologies]	4.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	15
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Mid-term test [PRESENCIAL][Assessment tests]	3.75
Mid-term test [PRESENCIAL][Assessment tests]	3.75
	Total horas: 150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Connolly y Begg	Database Systems (6th edition)	Pearson Addison-Wesley		978-01-329-4326-0	2015	
	https://www.pearson.com/us/higher-education/program/Connolly-Database-Systems-A-Practical-Approach-to-Design-Implementation-and-Management-6th-Edition/PGM116956.html					
Elmasri y Navathe	Fundamentals of Database Systems (6th edition)	Pearson Addison-Wesley		9780136086208	2011	
	https://www.pearson.com/us/higher-education/product/Elmasri-Fundamentals-of-Database-Systems-6th-Edition/9780136086208.html					
Marqués	Bases de Datos	Publicaciones Univ. Jaume I		978-84-693-0146	2011	
Piattini, Marcos, Calero y Vela	Tecnología y diseño de bases de datos	Ra-Ma		8478977333	2006	
	http://www.ra-ma.es/libros/TECNOLOGIA-Y-DISENO-DE-BASES-DE-DATOS/235/978-84-7897-733-8					
Silberschatz, Korth y Sudarshan	Database System Concepts (6th edition)	McGraw-Hill		978-00-735-2332-3	2010	
	https://www.mheducation.com/highered/product/database-system-concepts-silberschatz-korth/M9780073523323.html (Otra pagina www.db-book.com/db6/)					