

340457 - DABD-I7P23 - Databases Design and Administration

Coordinating unit:	340 - EPSEVG - Vilanova i la Geltrú School of Engineering		
Teaching unit:	723 - CS - Department of Computer Science		
Academic year:	2019		
Degree:	BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2018). (Teaching unit Compulsory) BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Teaching unit Optional)		
ECTS credits:	6	Teaching languages:	Catalan

Teaching staff

Coordinator:	Jordi Esteve
Others:	Jordi Esteve

Opening hours

Timetable:	See the current timetable in the EPSEVG people list: https://web3.epsevg.upc.edu/coneix-lepsevg/directori-epsevg
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Prior skills

The ones of the Programming subjects.

Degree competences to which the subject contributes

Specific:

1. CEC01. Ability to have a thorough understanding of the fundamental principles and models of computation, ability to apply the principles to interpret, select, evaluate, model, and create new concepts, theories, applications and advance the technological development related to computing.
2. CECO5. Ability to acquire, obtain, formalize and represent human knowledge in a computable form for problem solving by using a computer system in any scope, particularly those related to aspects of computation, perception and action in intelligent environments.
3. CEFC8. Ability to analyze, to design, to construct and to maintain applications in a well built, secure and efficient way choosing the most adequate paradigms and languages.
4. CEIS4. Ability to identify and analyze problems and design, develop, deploy, test and document software solutions based on an adequate knowledge of theories, models and techniques.
5. CESI2. Ability to determine the requirements of information and communication systems of an organization paying attention to safety aspects according to security and compliance with regulations and legislation.

Teaching methodology

Mix sessions with theoretical developments and practical exercises.

Learning objectives of the subject

Ability to design relational databases for specific applications. Ability to effectively manage relational databases, mastering the advantages and disadvantages of the main available mechanisms. Ability to design and manage non-relational databases, with mastery of advantages and disadvantages compared to relational systems.



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Study load

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours medium group:	0h	0.00%
	Hours small group:	30h	20.00%
	Guided activities:	0h	0.00%
	Self study:	90h	60.00%

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Content

(ENG) - Disseny relacional per normalització	Learning time: 6h Theory classes: 3h Laboratory classes: 1h Self study : 2h
Description: (ENG) Normalització. Primera, segona i tercera formes normals: la seva obtenció. Forma normal de Boyce-Codd. Altres formes normals. Sobrenormalització i sotnormalització. Magatzems de dades amb diagrames estel i flocc-de-neu.	
(ENG) Disseny relacional per transformació de classes i associacions	Learning time: 12h Theory classes: 5h Laboratory classes: 3h Self study : 4h
Description: (ENG) Analogies i diferències entre diagrames de classes UML i diagrames relacionals. Transformació.	
(ENG) - Optimització de consultes i administració d'índexs	Learning time: 17h Theory classes: 8h Laboratory classes: 4h Self study : 5h
Description: (ENG) Implementació d'operacions relacionals bàsiques; les seves combinacions. Anàlisi sintàctica de consultes: optimització per manipulació d'arbres sintàctics. Índexs B* i "hash": índex "clustered".	
(ENG) - Sistemes no-SQL i not-only-SQL	Learning time: 13h Theory classes: 8h Laboratory classes: 2h Self study : 3h
Description: (ENG) - Persistència; consideracions sobre la assignació a discs: miralls, bitàcores; recuperació de fallides; procés transaccional: atomicitat. Nivells estàndar d'aïllament: avantatges i inconvenients de cadascú; com triar-ne el més adient.	

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(ENG) - Optimització de consultes relacionals i administració	Learning time: 12h Theory classes: 2h Laboratory classes: 4h Self study : 6h
Description: (ENG) - SQL i els sistemes relacionals: avantatges i inconvenients. Alternatives recents "no-SQL" i "not-only-SQL": consideracions rellevants.	

Qualification system

C1 = First Test. Individual written test (2 hours).

C2 = Second Test. Individual written test (3 hours) which integrates knowledge and skills of the entire course.

Act = Grade obtained from the grade of 2 activities, both with the same weight.

Pra = Grade obtained from the individual practice (an application using a RDBMS).

$$\text{Final Grade} = \max(0,30 \cdot C1 + 0,30 \cdot C2, 0,60 \cdot C2) + 0,10 \cdot \text{Act} + 0,30 \cdot \text{Pra}$$

The presentation of the practice will be mandatory to pass the course; otherwise, the final grade of the whole subject will be 'NP'.

The Review Test, written test of maximum 3 hours, replaces the note of the Final Test, therefore corresponds to 60% of the final grade.

Bibliography