

## BASIC DETAILS:

<b>Subject:</b>	TECNOLOGÍAS DE LA INFORMACIÓN		
<b>Id.:</b>	30072		
<b>Programme:</b>	GRADUADO EN INGENIERÍA INFORMÁTICA. PLAN 2008 (BOE 15/12/2008)		
<b>Module:</b>	GESTION DE LA INFORMACION Y EL CONOCIMIENTO		
<b>Subject type:</b>	OBLIGATORIA		
<b>Year:</b>	3	<b>Teaching period:</b>	Segundo Cuatrimestre
<b>Credits:</b>	6	<b>Total hours:</b>	150
<b>Classroom activities:</b>	68	<b>Individual study:</b>	82
<b>Main teaching language:</b>	Inglés	<b>Secondary teaching language:</b>	Castellano
<b>Lecturer:</b>		<b>Email:</b>	

## PRESENTATION:

The Information Technologies course addresses the following contents to be applied during the acquisition, processing, storage, and transport of information: access, transactions and concurrency control in databases, No-SQL databases, Data warehousing, and Big Data. In this course, the emphasis is on the practical and real use of different databases, not just the relational ones.

## PROFESSIONAL COMPETENCES ACQUIRED IN THE SUBJECT:

<b>General programme competences</b>	G13	Capacity to use individual learning strategies aimed at continuous improvement in professional life and to begin further studies independently.
	G14	Capacity for abstraction to handle various complex knowledge models and apply them to examining and solving problems.
	G15	Capacity to structure reality by means of linking objects, situations and concepts through logical mathematical reasoning.
<b>Specific programme competences</b>	E12	Capacity to manage complexity through abstraction, modelling, 'best practices', patterns, standards and the use of the appropriate tools.
	E13	Capacity to identify, assess and use current and emerging technologies, considering how they apply in terms of individual or organisational needs.
<b>Learning outcomes</b>	R01	Understand data storage techniques and access methods.
	R02	Undertake consultation processing and heuristic implementation of operations based on cost estimation.
	R03	Create transaction processing, contemplating integrity, concurrency control and recovery techniques.
	R04	Establish database security and authorisation procedures.

## PRE-REQUISITES:

It is recommended to have attended Information Systems. Failing that, knowledge of the relational models of data and relational databases will be required.

## SUBJECT PROGRAMME:

### Subject contents:

<b>1 - Relational Databases</b>
1.1 - Architectures
1.2 - Transactions and Concurrency Control
<b>2 - NoSQL Databases</b>
2.1 - Document Databases
2.2 - Key-Value Databases
2.3 - Wide-Column Stores
2.4 - Graph Databases
<b>3 - Data Warehousing</b>
3.1 - Data Warehousing

3.2 - Data Analysis: OLAP and DSS
3.3 - Data Integration (ETL)
<b>4 - Big Data</b>
4.1 - Distributed Data Processing technologies
4.2 - Cloud Computation

Subject planning could be modified due unforeseen circumstances (group performance, availability of resources, changes to academic calendar etc.) and should not, therefore, be considered to be definitive.

## TEACHING AND LEARNING METHODOLOGIES AND ACTIVITIES:

### Teaching and learning methodologies and activities applied:

This course will use the following methodologies in order to give the students the best opportunity to develop their competences: lectures, workshops, and tuition sessions.

Lectures will be used to explain the basis of the different chapters. When possible, explanations will be accompanied by images and simple examples to be used as discussion topics and facilitate the understanding. The slides of the lectures will be available in the Online University Platform (pdu.usj.es) and students should be able to expand their content with the class explanations and other bibliographic resources.

Workshops will be used to apply and test the concepts learned during the lectures using different technologies. All readings, practices and works will be announced using the Online University Platform (pdu.usj.es). In the individual works, students must study the material presented and try to solve the exercises and problems proposed. In the group work, students will use the problem-based learning methodological strategy. Moreover, the practical work will be the goal and responsibility of the whole group.

Tuition sessions will be scheduled with the students upon the beginning of the course. There will be a weekly 2 hour slot assigned for individual and group tuitions. During the defined schedule, the lecturer will be available to answer the students' questions concerning the course.

Participation in class will be accounted in the final score.

### Student work load:

Teaching mode	Teaching methods	Estimated hours
Classroom activities	Master classes	10
	Workshops	53
	Assessment activities	5
Individual study	Tutorials	5
	Individual coursework preparation	64
	Group coursework preparation	5
	Research work	8
Total hours:		150

## ASSESSMENT SCHEME:

### Calculation of final mark:

Individual coursework:	50	%
Group coursework:	10	%
Final exam:	30	%
Participation:	10	%
<b>TOTAL</b>	<b>100</b>	<b>%</b>

\*Las observaciones específicas sobre el sistema de evaluación serán comunicadas por escrito a los alumnos al

inicio de la materia.

## **BIBLIOGRAPHY AND DOCUMENTATION:**

### **Basic bibliography:**

ELMASRI, Ramez; NAVATHE, Shamkant B. Fundamentals of Database Systems. Addison Wesley, 2007 (5th edition), 2010 (6th edition)

### **Recommended bibliography:**

#### **Recommended websites:**

Extensible Markup Language (XML)	<a href="http://www.w3.org/XML/">http://www.w3.org/XML/</a>
IEEE Data Engineering Bulletin	<a href="http://www.informatik.uni-trier.de/~ley/db/journals/debu/index.html">http://www.informatik.uni-trier.de/~ley/db/journals/debu/index.html</a>
Learning Center of the ACM	<a href="http://learning.acm.org/">http://learning.acm.org/</a>
Microsoft SQL Server	<a href="http://www.microsoft.com/sqlserver/en/us/default.aspx">http://www.microsoft.com/sqlserver/en/us/default.aspx</a>
Oracle Database	<a href="http://www.oracle.com/us/products/database/index.html">http://www.oracle.com/us/products/database/index.html</a>
Pentaho Business Analytics	<a href="http://www.pentaho.com/">http://www.pentaho.com/</a>
PostgreSQL open source database	<a href="http://www.postgresql.org/">http://www.postgresql.org/</a>

\* Guía Docente sujeta a modificaciones