



## IDENTIFYING DATA

### Information Systems

|                     |  |          |      |            |
|---------------------|--|----------|------|------------|
| Subject             | Information Systems  |          |      |            |
| Code                | V05G301V01309  |          |      |            |
| Study programme     | Degree in Telecommunications Technologies Engineering  |          |      |            |
| Descriptors         | ECTS Credits   | Choose   | Year | Quadmester |
|                     | 6  | Optional | 3rd  | 2nd        |
| Teaching language   | Spanish  |          |      |            |
| Department          |  |          |      |            |
| Coordinator         | García Duque, Jorge  |          |      |            |
| Lecturers           | García Duque, Jorge  |          |      |            |
| E-mail              | jgd@det.uvigo.es   |          |      |            |
| Web                 | http://fatic.uvigo.es  |          |      |            |
| General description | The aim of this subject is to introduce to the student in the main technologies to process and store the information, like central element of the telematic services |          |      |            |

## Competencies

|      |  |
|------|--|
| Code |  |
| B3   | CG3: The knowledge of basic subjects and technologies that enables the student to learn new methods and technologies, as well as to give him great versatility to confront and adapt to new situations   |
| B4   | CG4: The ability to solve problems with initiative, to make creative decisions and to communicate and transmit knowledge and skills, understanding the ethical and professional responsibility of the Technical Telecommunication Engineer activity.   |
| B6   | CG6: The aptitude to manage mandatory specifications, procedures and laws.   |
| B9   | CG9: The ability to work in multidisciplinary groups in a Multilanguage environment and to communicate, in writing and orally, knowledge, procedures, results and ideas related with Telecommunications and Electronics.   |
| C27  | CE27/TEL1 The ability to construct, operate and manage telecommunication networks, services, processes and applications considered as systems to receive, transport, represent, process, store, manage and present multimedia information from the computer services point of view.                            |
| C29  | CE29/TEL3 The ability to build, operate and manage computer services using planning, sizing and analytical tools   |
| D2   | CT2 Understanding Engineering within a framework of sustainable development.   |
| D3   | CT3 Awareness of the need for long-life training and continuous quality improvement, showing a flexible, open and ethical attitude toward different opinions and situations, particularly on non-discrimination based on sex, race or religion, as well as respect for fundamental rights, accessibility, etc. |
| D4   | CT4 Encourage cooperative work, and skills like communication, organization, planning and acceptance of responsibility in a multilingual and multidisciplinary work environment, which promotes education for equality, peace and respect for fundamental rights.  |

## Learning outcomes

| Expected results from this subject   | Training and Learning Results |     |          |
|--|-------------------------------|-----|----------|
| Know the main mechanisms of organisation of the information for their storage and process.             |                               | C27 |          |
| Know the main mechanisms of research, recovery and presentation of the information.                    |                               | C27 |          |
| Comprise the concept of metainformation and its main applications in the new telematic services.       |                               | C27 |          |
| Capacity to design and implement a database using current models.                                      |                               | C29 |          |
| Comprise the importance of information management like a basic support element for telematic services. | B3                            | C29 | D3       |
| Skill to select the mechanisms of information management more suitable for a problem.                  | B4<br>B6                      | C27 | D2       |
| Capacity to build telematic services based in stored information.                                      | B4<br>B6<br>B9                | C29 | D2<br>D4 |

| <b>Contents</b>   |   |
|---|---|
| Topic   |   |
| Introduction and general perspective of the Systems of Information. | <ul style="list-style-type: none"> <li>- Concepts of system of information and database.</li> <li>- Types of systems of information.</li> <li>- Concept of Managing System of Databases.</li> <li>- Models of databases.</li> <li>- The process of design of a database.</li> </ul>   |
| Design of Relational Databases: Conceptual Model.                   | <ul style="list-style-type: none"> <li>- Aims of the conceptual design.</li> <li>- Conceptual models of databases.</li> <li>- The E-A model.</li> </ul>   |
| Design of Relational Databases: Logical Model.                      | <ul style="list-style-type: none"> <li>- Concept of the logical design.</li> <li>- Logical models of databases.</li> <li>- The relational model.</li> <li>- Relational algebra.</li> <li>- Normalisation of databases.</li> </ul>   |
| Database Management Systems.  | <ul style="list-style-type: none"> <li>- Physical storage of the data.</li> <li>- Organisation of data in files.</li> <li>- Indexes and associations.</li> <li>- Management of the integrity of the data.</li> <li>- Consistency.</li> <li>- Concepts related with the security.</li> <li>- Optimisation of queries.</li> </ul> |
| Other information systems.  | <ul style="list-style-type: none"> <li>- No relational databases.</li> <li>- Semistructured information Processing.</li> <li>- No-structured information Processing.</li> <li>- Semantic information processing.</li> </ul>   |

| <b>Planning</b>                 |             |                             |             |
|---------------------------------|-------------|-----------------------------|-------------|
|                                 | Class hours | Hours outside the classroom | Total hours |
| Lecturing                       | 20          | 46                          | 66          |
| Practices through ICT           | 13          | 26                          | 39          |
| Workshops                       | 5           | 30                          | 35          |
| Problem and/or exercise solving | 1           | 0                           | 1           |
| Laboratory practice             | 1           | 0                           | 1           |
| Essay                           | 2           | 6                           | 8           |

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

| <b>Methodologies</b>  |   |
|-----------------------|---|
|                       | Description   |
| Lecturing             | Presentation of the ideas, concepts, technics and algorithms of each lesson.<br>This activity develops CG3, CG4, CG6, CT2 and CT3 competencies.   |
| Practices through ICT | The students will resolve practical problems under supervision of teachers.<br>This activity develops CG4, CT2, CE29 and CE27 competencies.   |
| Workshops             | Each group of students will tackle the design and implementation of a software project with half complexity. This task will be realised in successive steps, that will be discussed and validated in the face-to-face sessions.<br>The aim of this methodology is to provide a suitable feedback to improve the proposed solutions.<br>This activity develops CG4, CG9, CT2, CT4 and CE27 competencies. |

| <b>Personalized assistance</b> |  |
|--------------------------------|--|
| Methodologies                  | Description  |
| Workshops                      | The professor will be present during the realisation of the workshops, answering all the doubts that can arise to the students.                  |
| Practices through ICT          | The professor will be present during the realisation of the practices, answering all the doubts that can arise to the students.                  |
| Lecturing                      | In the development of the master sessions, the students will be able to interrupt and formulate all the questions or doubts that can arise them. |

| <b>Assessment</b> |             |               |                               |
|-------------------|-------------|---------------|-------------------------------|
|                   | Description | Qualification | Training and Learning Results |

|                                 |   |    |                |                  |
|---------------------------------|---|----|----------------|------------------|
| Problem and/or exercise solving | Proof of theoretical contents exposed in the master classes.  | 60 | B3<br>B4<br>B6 | D2<br>D3         |
| Laboratory practice             | Evaluation of the work carried out in the sessions of laboratory.   | 20 | B4             | C27<br>C29<br>D2 |
| Essay                           | In the last face-to-face session of workshop, students will deliver and will expose to their mates the design and the proposed solution for their project. This solution will be exposed to debate for students and professors.<br><br>The professor will do questions for each member of the group, what will allow his individual evaluation. | 20 | B4<br>B9       | C27<br>D2<br>D4  |

### Other comments on the Evaluation

The subject can be surpassed by means of Continuous Evaluation according to the following criteria, having opened the possibility to opt by the No Continuous Evaluation anytime until the beginning of the final examination to celebrate the day fixed to such effect in the official calendar of the EET. All those students that opt by the continuous evaluation will consider presented if they evaluate of the part of the work in Workshops.

#### Continuous evaluation:

The final mark will result of the sum of the corresponding notes to the three following components:

1. Three proofs of type short answer questions to evaluate the contents given in the masterclasses. Each proof will take place in one of the master classes , except the last that will carry out in one of the sessions of the Workshop.

Score: Up to 2 points each proof. ( $T=t_1+t_2+t_3$ )

2. One Practical Proofs that will carry out at the last session of laboratory.

Score: Up to 2 points. (L)

3. Presentation of the Project proposed like work in the sessions of the Workshop.

Score: Up to 2 points. (P)

To pass the subject by Continuous Evaluation will have to give the three following conditions: (i) obtain an equal or upper qualification to 2 points in the group of the tests.; (ii) Upper qualification to 0.75 points in the practical proof; and (iii) to attend all the face-to-face sessions and obtain more than 0 points in the presentation of the project. In the case to fulfil the three previous conditions, the final mark of the continuous evaluation will be the sum of the three components ( $Mark=T+L+P$ ). If the student does not fulfil any of the three conditions, the mark of the continuous evaluation will be the minimum of the marks obtained in each one of the three components ( $Mark=\min(T,L,P)$ )

#### No Continuous Evaluation:

By means of an examination on 10 points scheduled in the official calendar of the EET.

#### Second and Extraordinary call:

It will be governed by the indicated for the No Continuous evaluation.

### Sources of information

#### Basic Bibliography

Abraham Silberschatz, Henry Korth y S. Sudarshan, **Database System Concepts**, 6, McGraw-Hill, 2010

Anthony Molinaro, **SQL Cookbook**, 1, O'Reilly Media, 2005

#### Complementary Bibliography

Ramez Elmasri y Shamkant Navathe, **Fundamentals of Database Systems**, 6, Addison Wesley, 2010

Hector Garcia-Molina, Jeffrey D. Ullman y Jennifer Widom, **Database Systems: The Complete Book**, 2, Prentice Hall, 2008

Jeffrey D. Ullman y Jennifer Widom, **A First Course in Database Systems**, 3, Prentice Hall, 2007

Chris J. Date, **An Introduction to Database Systems**, 8, Addison Wesley, 2003

Chris J. Date, **Database Design and Relational Theory: Normal Forms and All That Jazz**, 1, O'Reilly Media, 2012

Clare Churcher, **Beginning Database Design: From Novice to Professional**, 1, Apress, 2007

Rick A Morelan, **Beginning SQL Joes 2 Pros: The SQL Hands-On Guide for Beginners**, 1, BookSurge Publishing., 2009

### Recommendations

**Subjects that are recommended to be taken simultaneously**

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Architectures and Services/V05G300V01645

Distributed and Concurrent Programming/V05G300V01641

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**Subjects that it is recommended to have taken before**

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Internet Services/V05G300V01501

Operating Systems/V05G300V01541

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**Contingency plan**

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**Description**

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Teaching of groups To in the case in that it have to make on-line:

it will make through remote campus and by means of forums of debate in \*faitic

Teaching of groups \*B in the case in that it have to make on-line:

it will make through remote campus and by means of forums of debate in \*faitic

Teaching of groups C in the case in that it have to make on-line:

it will make through remote campus and by means of forums of debate in \*faitic

Evaluation in the case in that it have to make on-line.

It will make through remote campus and/or by means of the available tools in \*faitic

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