



Teaching Guide

| Teaching Guide | | | | |
|---------------------|---|--------|------------|--|
| Identifying Data | | | 2019/20 | |
| Subject (*) | Databases | | Code | 614G01013 |
| Study programme | Grao en Enxeñaría Informática | | | |
| Descriptors | | | | |
| Cycle | Period | Year | Type | Credits |
| Graduate | 2nd four-month period | Second | Obligatory | 6 |
| Language | SpanishGalicianEnglish | | | |
| Teaching method | Face-to-face | | | |
| Prerequisites | | | | |
| Department | Ciencias da Computación e Tecnoloxías da InformaciónComputación | | | |
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| Web | | | | |
| General description | | | | |

Study programme competences

| Code | Study programme competences |
|------|---|
| A18 | Coñecemento e aplicación das características, funcionalidades e estrutura das bases de datos, que permitan o seu adecuado uso, e o deseño e a análise e implementación de aplicacións baseadas nelas. |
| A19 | Coñecemento e aplicación das ferramentas necesarias para o almacenamento, procesamento e acceso aos sistemas de información, incluídos os baseados en web. |
| B1 | Capacidade de resolución de problemas |
| B3 | Capacidade de análise e síntese |
| B4 | Capacidade para organizar e planificar |
| C3 | Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida. |
| C6 | Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse. |
| C7 | Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida. |

Learning outcomes

| Learning outcomes | Study programme competences | | |
|---|-----------------------------|----------------|----------|
| Knowledge and understanding of the concepts, principles, and basic theories of relational databases. | A18 | B3 | C7 |
| Ability to model and design relational databases in order to allow the storage of the information needed for specific application domains, taking special care with the integrity of the data and the needs of the organization that will use the database. | A18 | B1 B3 B4 | C3 C6 |
| Ability to manage and use relational databases by executing SQL statements. | A18 A19 | B1 B3 | C3 C7 |



| Contents | |
|-------------------------------|---|
| Topic | Sub-topic |
| Relational databases | SQL: advanced queries, DDL, embedded SQL, views. |
| Database design | Design problems Design phases Normalization Conceptual design ER to relational model translation |
| File systems | Files Indexes |
| Concurrency and fail recovery | Problems due to concurrency and failures Transactions Recovery techniques Concurrency control techniques |

| Planning | | | | |
|---|--------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests | Competencies | Ordinary class hours | Student's personal work hours | Total hours |
| Guest lecture / keynote speech | A18 A19 C6 C7 | 22 | 22 | 44 |
| Problem solving | A18 B3 B1 C6 | 22 | 33 | 55 |
| Laboratory practice | A18 A19 B1 C3 | 9 | 13.5 | 22.5 |
| Supervised projects | A18 B1 B3 B4 C3 C6 | 8 | 12 | 20 |
| Mixed objective/subjective test | A18 B1 B3 C6 | 3 | 4.5 | 7.5 |
| Personalized attention | | 1 | 0 | 1 |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | | |

| Methodologies | |
|---------------------------------|---|
| Methodologies | Description |
| Guest lecture / keynote speech | Classroom lectures. In them, the fundamental contents of the subject will be exposed. They are devoted to showing objectives, motivation, concept development, utility, and summary. |
| Problem solving | Problem solving lectures where a problem to solve is exposed. First, the student tries to solve the problem for a while, considering different aspects to solve it. Finally, the problem is solved in the blackboard, showing the typical errors of the solutions provided by the students. |
| Laboratory practice | In laboratory classes, teachers present the knowledge needed to acquire the proposed skills, and students will do exercises that will lead them to develop their operative skills. |
| Supervised projects | Project consisting of designing and implementing a relational database. The student shall develop it alone, with some assistance from the teacher. |
| Mixed objective/subjective test | Tests to be done in a limited time, in which both theoretical and practical knowledge is evaluated. |

| Personalized attention | |
|------------------------|-------------|
| Methodologies | Description |



| | |
|--|---|
| Laboratory practice Supervised projects | <p>In the laboratory, there will be a semi-personalized support (since the groups are formed by around 15/20 people). The teacher will attend specific questions to each student.</p> <p>The teacher will attend any doubt related to the supervised project, both in the classroom or in the office. The final result will be reviewed individually with each student.</p> |
|--|---|

| Assessment | | | |
|---------------------------------------|--------------------|--|---------------|
| Methodologies | Competencies | Description | Qualification |
| Mixed objective/subjective test | A18 B1 B3 C6 | <p>Both at the FIRST OPPORTUNITY and at the SECOND OPPORTUNITY, for passing the course it is necessary to pass a conventional written exam which will represent 75% of the global grade.</p> <p>To pass the course globally it is necessary to obtain in the written exam a minimum grade of 3.5 (over 7.5). If that minimum grade is not achieved, the maximum global grade will not exceed 4.5 (and therefore the course will be failed)</p> <p>Maximum grade: 7.5 points Minimum grade to pass the course: 3.5 (over 7.5)</p> | 75 |
| Laboratory practice | A18 A19 B1 C3 | <p>For the FIRST OPPORTUNITY:</p> <p>-SQL language test (maximum grade 1 pt).</p> <p>For the SECOND OPPORTUNITY:</p> <p>-SQL language test (maximum grade 1 pt).</p> | 10 |
| Supervised projects | A18 B1 B3 B4 C3 C6 | <p>For the FIRST OPPORTUNITY:</p> <p>-Database design and implementation project (Maximum grade 1,5 pt).</p> <p>For the SECOND OPPORTUNITY:</p> <p>-Unrecoverable. The grade from the first opportunity is kept</p> | 15 |

Assessment comments



FIRST OPPORTUNITY

In the FIRST OPPORTUNITY, students that do not take the written exam will obtain a grade of "Non presentado" (Absent). According to the UDC regulations, if a student passes the course in the FIRST OPPORTUNITY, he/she will not be able to be evaluated in the SECOND OPPORTUNITY in order to improve his/her grade. If a student fails the course in the FIRST OPPORTUNITY, he/she can retake the SQL language test, the written exam or both in the SECOND OPPORTUNITY. In the SECOND OPPORTUNITY, students that do not re-take any of the tests (written test and/or SQL language test) will obtain a grade of "Non presentado" ("Absent"). If a student decides to retake a test, the final grade for that test will be the one obtained during the second opportunity (which can be higher or lower than the one obtained in the first opportunity). If a student decides to not retake one of the two tests, he/she will keep the grade for that test obtained in the first opportunity.

ACADEMIC DISPENSATION:
Students officially enrolled part-time who have been granted an official dispensation from attending classes, as stipulated in the regulations of this University, will be able to do (and submit) all (or part) of the practices by their own. In the case that the activities require specific equipment, or are scheduled for a specific date and time, a viable alternative will be provided, where possible, at their request.

ADVANCED OPPORTUNITY:
The assessment for the advanced opportunity will consist of a written exam that will compute for the 100% of the grade.

Sources of information

| | |
|----------------------|--|
| Basic | <ul style="list-style-type: none"> - A. Silberschatz; H. Korth; S. Sudarshan (2010). Database System Concepts. McGraw Hill - Elmasri, R.; Navathe, S. (2011). Database systems: models, languages, design, and application programming. Addison-Wesley - Alan Beaulieu (2009). Learning SQL (2nd Ed). O'Reilly |
| Complementary | <ul style="list-style-type: none"> - Cuadra, D.; Castro, E.; Iglesias, A. M.; Martínez, P.; Calle, F. J.; de Pablo, C.; Al-Jumaly, H.; Mo (2007). Desarrollo de Bases de Datos: casos prácticos desde el análisis a la implementación. Madrid: Ra-ma - de Miguel, A.; Martínez, P.; Castro, E.; Cervero, M.; Cuadra, D.; Iglesias, A. M.; Nieto, C. (2001). Diseño de bases de datos. Problemas resueltos. Madrid: Ra-ma |

Recommendations

Subjects that it is recommended to have taken before

Computer Science Preliminaries/614G01002
Programming II/614G01006

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.