COURSE DATA

Data Subject	
Code	33846
Name	Databases
Cycle	Grade
ECTS Credits	6.0
Academic year	2021 - 2022

Study (s)

Degree	Center	Acad. year	Period
1007 - Degree in Information and Documentation	Faculty of Geography and History	3	First term

Subject-matter

Degree	Subject-matter	Character
1007 - Degree in Information and Documentation	7 - Information technologies and digital editing	Obligatory

Coordination

Name	Department
FUERTES SEDER, ARIADNA	240 - Computer Science

SUMMARY

The course “Databases” consists of 6 ECTS credits and is taught in 3rd year, 5th semester of the degree. It is framed within the field of Information Technology and Digital Publishing.

Its main objective is to present the principles of database systems with an emphasis on how are used in the development of information systems. So, the student will be able to:

- To acquire a historical context about databases.
- To know the characteristics and components of the Database Management Systems (DBMS) and to understand its way of operation.
- To present the theoretical foundations and the data representation models.
- To introduce the basic aspects of the relational data model.
- To know the data definition and manipulation languages.
- To learn to use the BD management languages from the point of view of the user, as the basic tool to work with data in a relational database. Structured Query Language (SQL).

- To introduce a methodology for designing relational databases, covering the conceptual design and logical design.
- To understand and manage the theory of Normalization.

Among the topics covered in this course, the principles and designs of how to organize the information stored on a computer and how to update and retrieve such information will be treated.

This course aims to provide students with a basic training in the creation of relational databases and learn to interact with them using a query language. So that, they will know as such information is organized and thus the possibilities offered by the information system.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

There are no specified enrollment restrictions with other subjects of the curriculum.

It is advisable to have taken the Sistemas de representación de información y conocimiento (3er semester) and Arquitectura de la información en la Web (4th semester) courses prior to taking this course, it means, in the order established by semesters.

OUTCOMES

1007 - Degree in Information and Documentation

- Capacity to write analytical reports and summaries with regard to management and organisation of information.
- Demonstrate organisational and planning skills.
- Know a foreign language.
- Have computer skills related to the field of study.
- Have skills for information management.
- Have problem-solving skills.
- Have decision-making capacity.
- Be able to work in a team and to integrate into multidisciplinary teams.
- Be able to apply critical reasoning to the analysis and assessment of alternatives.

- Show ethical commitment in the relationships with users and in information handling.
- Be able to learn independently.
- Show creativity.
- Be able to search and retrieve information by methods that meet the expectations and needs of users in optimal conditions of cost and time.
- Be able to design information products and services in any field and by any means of dissemination (electronic edition) according to the information and training needs detected in a community of users.
- Be able to use and put into practice methods, techniques and computer tools (hardware or software) for the design, implementation, development and operation of information systems.
- Understand, design and apply models for data and information representation, and mechanisms for data extraction and exploitation and for information retrieval.
- Know, use and apply information and communication technologies applied to the storage, use, management, handling, distribution and exploitation of data, information and knowledge.
- Know, use and apply the computer and telecommunications tools that support the development of the set of skills that must be acquired in the training process.

LEARNING OUTCOMES

This course will provide students with the following learning results:

- To know how to search and retrieve information.
- To be able to design products and information services.
- To use and implement methods, techniques and tools (hardware or software) for designing, implementation, development and minning of information systems.
- To understand, design and implement data models and information models, and the mechanisms for extraction and data mining and information retrieval.

DESCRIPTION OF CONTENTS

1. Introduction to the Data Bases

Lecture 1. Introduction
1.1.- Evolution of DB technologies
1.2.- File management systems.
1.3.- DB Systems. Database Management Systems.
1.4.- Classification of the DB.

The objectives of this subject are:
- To acquire a historical context of databases.
- To know the characteristics and components of a databases management system and overall understanding of how it works.

2. Relational DataBases

Lecture 2. Relational Databases
2.1 Basic concepts of relational databases.
2.2 Methodology to design for the relational DB.

The objectives of this subject are:
- To view the fundamentals and the designs for database.
- To present the basic aspects of the relational data model.
- To present a methodology for designing relational databases, covering the conceptual design and logical design that will be developed on the following topics.

3. Conceptual design of relational databases

Lecture 3. Conceptual design of relational databases

3.1 The Entity-Relationship Model

This topic presents the Entity-Relationship Model as conceptual design methodology of relational databases.

4. Logical data model of relational databases

Lecture 4. Logical data model of relational DB.
4.1 The relational model.
4.2 Relational Algebra.

The objectives of this subject are as folows:
- To present the relational model as a model of logical design.
- To present the relational algebra as the language for the manipulation of relational data.

5. Query languages. SQL

Lecture 5. Query languages. SQL

The objectives of this subject are:
- To know the data definition and manipulation languages.
- To acquire mastering for the DB management languages from the user's point of view.
- To understand and manage the SQL language.

6. Theory of Normalization

Lecture 6. Theory of Normalization

This subject aims to understand and manage the theory of normalization in order to design relational databases

7. Laboratory sessions

This section corresponds to the contents of the laboratory sessions.
The objectives are:

- To learn the use of a basic database management system so as allows us to entering design constraints seen in the theoretical part.
- To learn to extract the information contained in a database using a query language, in this case, SQL.
- To learn to use developer tools such as data entry forms or reporting of results of a query to interact more friendly way with the database.

Eleven sessions will be held and the student will learn:
- To view and manipulate a database management system (DBMS).
- To create database in DBMS.
- To create data entry forms in DBMS.
- To create reports in DBMS.
- To create SQL queries into DBMS.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	37,50	100
Laboratory practices	22,50	100
Attendance at events and external activities	5,00	0
Development of group work	10,00	0
Development of individual work	15,00	0
Study and independent work	10,00	0
Readings supplementary material	10,00	0
Preparation of evaluation activities	11,00	0
Preparing lectures	10,00	0
Preparation of practical classes and problem	15,00	0
Resolution of case studies	4,00	0
TOTAL	**150,00**	

TEACHING METHODOLOGY

REGULAR LECTURES:

- Attendance to theoretical-practical lectures: 37.5 hours of active lectures where the most difficult aspects of the lesson will be explained and also the students' questions will be answered about the subject which should have prepared. After, any activity that requires the involvement of students will be introduced, so that 1) they can do an activity based on the content they have just learnt, 2) they recover the level of attention to the next block.

The resolution of these exercises will make students on the blackboard and the proposed solution will be discussed thus ensures that participate more actively in the resolution of problems. In addition, the teacher may pose a more elaborate solution which is then projected by the projector cannon. With this technique we get students to see different approaches to the same problem.

- Attendance at laboratory sessions: there are 22.5 hours of lessons in computer room. These lessons are based on solving practical cases that the student must bring prepared. Attendance at laboratory sessions is mandatory and will be checked by the teacher (see the section on "Evaluation Practice").

Each session of laboratory will be 2 hours of duration and the student will learn to manage some DBMS and the databases will be implemented on this. This databases will be resolved in the theory classes, so that students can resolve the doubts such as the theoretical aspects as implementation itself.

For these sessions, students will have reviewed the main concepts to be used in the development of practice and to have read and understood the proposed statement. All of this will be reflected on the possible solution of the same.

For each subject the teacher deems appropriate, the student will solve a proposed exercise which will serve as a little test. It will take place during the first half hour of class.

THEORETICAL-PRACTICAL LECTURES PREPARATION:

Students will have to prepare the contents of the corresponding lecture, according to the planning of the course. To do this they used the basic and specific bibliography, as well as the material that will eventually provide them with the teacher. The total preparation time is approximately 20 hours.

PREPARATION OF PRACTICAL WORK:

Students spend about 40 hours or exercises solving practical issues proposals on the topics covered in lectures and then can be further implemented in the computer.

REALIZATION OF TEAMWORK:

A set of problems will be proposed that should be solved in teams of three or four persons. These groups will work collaboratively specific proposals by the teacher during the lectures or at home.

TUTORING:

There will be some tutoring hours per week where the lecturer will assist students to clarify concepts or doubts that have arisen during the lectures. It is estimated at 5 hours.

EVALUATION

At the first call, the evaluation of the subject will be conducted through the assessment of knowledge, skills and competences acquired by the student, both individually and in an environment of teamwork, following a scheme of continuous assessment.

The following aspects will be considered:

1**. Written test:** there will be only one final written test of theoretical-practical character. This test will be assessed: On the one hand, the understanding of the theoretical and conceptual aspects and associated formalism, through issues or simple particular cases. On the other hand, the ability to solve problems by applying the formalism and critical capacity regarding the results will be assessed. The grade obtained in this test represents 50% of the final mark.

2**. Continuous assessment**: Evaluation of the continuous practice knowledge acquired during the academic year in two ways:

a) Preparation of activities and problems that arise in the context of the lectures will have 15% of the final. Some of these activities will be developed individually and other ones in teams.

b) Doing several short test during practical classes in the computer room. With these tests, the students acquire skills to perform exercises on the computer and to present results through the creation of proposed databases, resolution of queries and development of data entry forms and reports. Realization of these tests is mandatory. These tests represent 35% of the final mark.

At the first call, the composition of the final mark will follow, in summary, the following table:

- Exam: 50%
- Preparation of lectures, theory questions and exercises: 15%
- Practical tests carried out in the computer room: 35%

TOTAL 100%

At the second call, the exam will only be taken into account and it will consist of both parts: a theoretical-practical test and an practical exercise test in the computer room. The theoretical-practical part will represent 65% of the final mark and the part on the computer room will involve 35%. The mínimum score a student must achieve to pass the course is 5 out of 10 in each part.

This assessment starts from the premise that teaching at the University of Valencia is, by definition, oncampus lecture delivery method. In this sense, the student should be aware that attendance at both the theoretical and practical lectures is essential for proper monitoring of the contents of the course. The student must also consider the possibility to enroll part time, when it is unable to attend all courses (60 credits). However, there is an exception for those students that justify it and request it. They have the possibility of being assessed without attending to all or part of the lectures. For these cases, students should proceed as follows:

At the beginning of the course, student should inform to lecturer responsible for the course, the incidence that makes her/him unable to attend the class. This must be adequately justified in documentary form.

- The lectures in charge, in the light of this information, will decide the possibility of evaluation without full or partial assistance to the lectures.
- Students who are in this situation must submit for evaluation all work required by the lecturer (not necessarily the same to those required for the course) and may also be called to defend them orally to the lecturer, and conduct a knowledge test. The weight of the final grade work will be 15% and the test the theoretical-practical knowledge 50% and the test on the computer room 35%. At the second call, the same criteria related before will be for all students.

Final grade will be according to the current legislation (Consejo de Gobierno de la UVEG – 27th of January of 2004, Reales Decretos 1044/2003 and 1125/2003):

- From 0 to 4,9: “Insufficient”
- From 5 to 6,9: “Sufficient”
- From 7 to 8,9: “Good-Very Good”
- From 9 to 10: “Excellent” o “Distinction”

REFERENCES

Basic

- Introduction to Database Systems
  http://proquest.safaribooksonline.com/book/databases/9788131731925
- Beginning SQL
  http://proquest.safaribooksonline.com/book/databases/sql/9780764577321
- Henry F. Korth, Abraham Silberschatz. Fundamentos de Bases de Datos. McGraw Hill, 2000
- Jefrey D. Ullman. "Introducción a las bases de datos". Prentice Hall, 1999.
- Ramez A. Elmasri, Shmkant B. Navathe. Fundamentos de Sistemas de Bases de Datos. Addison Wesley, 2002
- Adoración de Miguel Castaño [y otros]. "Diseño de bases de datos: problemas resueltos". Ra-Ma, Madrid. 2001
- J. Benavides, J.M. Olaizola y E. Rivero. "SQL para usuarios y programadores". Paraninfo. 1992

Additional

- The Manga Guide to Databases
  http://proquest.safaribooksonline.com/book/databases/9781593271909
- Simply SQL
  http://proquest.safaribooksonline.com/book/databases/sql/9780980455250
- SQL Pocket Guide
  http://proquest.safaribooksonline.com/book/databases/sql/9781449397586
- Beginning Database Design Solutions
  http://proquest.safaribooksonline.com/book/databases/database-design/9780470385494
- R. Ramakrishnan, J. Gehrke. Database Management Systems. McGraw-Hill, 2000
- T. Connolly, C. Carolyn Begg. Database systems. A practical approach to design, implementation and management. Addison Wesley, 2002
- C. J. Date. Introducción a los sistemas de bases de datos. Pearson Education, 1993

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

PRESENTIAL / SEMI-PRESENTIAL TEACHING

1. Contents

The contents initially included in the teaching guide are maintained

2. Workload and time schedule

The activities and their hours of dedication in ECTS credits marked in the original Course Guide will be kept. If the classrooms capacity according to the sanitary norms allows it, the theoretical and practical class attendance will be 100% (if the capacity couldn’t be guaranteed, the class attendance would be reduced). Teaching planning will be specified at the beginning of the term.

If the sanitary situation changes and no access to the University facilities is possible, all teaching activities will be carried out completely online. In this case, the adaptations will be communicated to the students through the Virtual classroom.

3. Teaching Methodology

Theory and practice classes that may be complemented with different types of materials and activities in the Virtual classroom.

Tutorials will be done online (through the UV corporate mail) or face-to-face by prior appointment with the teacher.

If the sanitary situation changes and no access to the University facilities is possible, teaching and tutorials will be carried out completely online. In this case, the adaptations will be communicated to the students through the Virtual classroom.

4. Evaluation

The evaluation criteria established in the Course Guide are kept.

If the University facilities were closed on the dates set in the official calendar for the final exam, the face-to-face exam will be replaced by an online test.

5. Bibliographic references

The recommended bibliography in the Course Guide is kept. If the sanitary situation changes and the access to the recommended bibliography is not possible, it will be replaced by materials accessible online.