

**COURSE DATA****Data Subject**

Code	44832
Name	Relational and Non-Relational Data Persistence
Cycle	Master's degree
ECTS Credits	4.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications	School of Engineering	1	Second term

Subject-matter

Degree	Subject-matter	Character
2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications	4 - Information and Content Management and Processing	Obligatory

Coordination

Name	Department
CERVERON LLEO, VICENTE	240 - Computer Science

SUMMARY

In the context of enterprise application development, the persistence layer is the fundamental component to guarantee the integrity of the information. The objective of this course is to present the methodologies, good practices and patterns that have been defined in the industrial context in order to build a quality persistence layer. When defining persistence, relational databases are still the most used option because they are widely tested and adapted to a wide variety of use cases. Nonetheless, non-relational solutions, also called non-SQL, are gaining acceptance in these environments, especially for dealing with large volumes of data or semi-structured or non-structured information. Therefore, different non-relational alternatives will also be introduced to provide an overview of the options available to build a persistence layer.



PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

Basic knowledge on relational databases and Java development is required.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
- Ability to apply acquired knowledge and solve problems in new or little-known environments within broader and multidisciplinary contexts, being able to integrate this knowledge.
- To foster, in academic and professional contexts, technological, social or cultural advancement within a society based on In knowledge and respect for: a) fundamental rights and equal opportunities between men and women; b) principles of equal opportunities and universal accessibility of persons with disabilities; and, c) the values of a culture of peace and democratic values.
- Ability to model, design, define the architecture, implement, manage, operate, and maintain applications, systems, services, networks and content in the field of Web technologies, cloud computing and mobile applications.



- Ability to analyze the storage needs that arise in an environment and to carry out the implantation of a solution in the fields of Web technologies, cloud computing and mobile applications.
- Ability to design and evaluate servers, applications and systems based on distributed computing.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

- Specify and complete computer tasks that are complex, incompletely defined or unfamiliar
- Describe and explain techniques and methods applicable to their particular area of study and identify their limitations
- Organize your own work independently, demonstrating initiative and exercising personal responsibility
- Perform bibliographic searches and reviews using databases and other sources of information
- Learning and improving personal performance as the basis for lifelong learning and professional development
- Communicate effectively both verbally and through other media to a variety of audiences and preferably in a second language
- Apply a methodological vision to build a layer of persistence based on relational technologies
- Configuring and Using Business Relational Data Persistence Frameworks (ORM, JPA)
- Configure and use non-relational databases
- Configure and use distributed memory storage

DESCRIPTION OF CONTENTS

1. Análisis, diseño e implementación de bases de datos relacionales

2. Implementation of the persistence layer in enterprise environments: The JPA standard

3. Persistence Layer Design Patterns

**4. Concepts and types of NoSQL databases: document, column and graph oriented****5. Databases distributed in memory (Redis)****WORKLOAD**

ACTIVITY	Hours	% To be attended
Theoretical and practical classes	40,00	100
Development of group work	6,00	0
Study and independent work	35,00	0
Preparation of practical classes and problem	16,00	0
Resolution of online questionnaires	3,00	0
TOTAL	100,00	

TEACHING METHODOLOGY

- Theory class: Development of the concepts of the subject by encouraging the participation of students in the resolution of specific issues
- Resolution of practical exercises in team: Development of exercises oriented to put into practice the concepts of theoretical activities and encourage teamwork
- Project-oriented learning: Presentation of a case study drawn from a real context for the elaboration of a project based on the contents of the subject.

EVALUATION

The assesment modalities used in this subject are:

SE1: Online assessment and/or degree of participation

SE2: Assessment of problems, works, reports and/or memories

SE4: Exam or face-to-face assessment

SE6: Assessment of laboratory

A series of activities will be proposed during the classes, evaluating the participation (SE1) and the contributions (SE4)

A series of laboratory practices will be proposed to be developed during the course (SE6).



A final project will be proposed that will be evaluated at the end of the subject comprising a memory, the software developed and an oral defense. (SE2)

The final grade will be obtained by weighting the different assessment systems listed in the table, provided that a minimum score of 5 is obtained in the final project.

Final score: $SE1 * 0.05 + SE4 * 0.05 + SE6 * 0.5 + SE2 * 0.4$

For the second call, components SE1 and SE4 are considered non-recoverable because they can only be evaluated during the school year.

SE2 and SE6 components are maintained in the case for the second call, and improvements to the tasks made during the course can be presented for the second call.

The final project may be presented and evaluated in the two calls, although it will be penalized with one point less in the second call.

The grading system is specified at the following link:

<http://www.uv.es/uvweb/universidad/es/estudios-postgrado/informacion-administrativa-postgrado/permanencia-calificaciones/calificaciones-1285897761928.html>

The applicable regulations can be found at the following link:

<http://www.uv.es/uvweb/universidad/es/estudios-grado/informacion-academica-administrativa/normativas/normativas-universidad-valencia-1285850677111.html>

REFERENCES

Basic

- Harrington, Jan L. 2016. Relational Database Design and Implementation, 4th Edition. 4th ed. Morgan Kaufmann. <http://proquest.safaribooksonline.com/book/databases/9780128499023>.
- Keith, Mike, and Merrick Schincariol. 2013. Pro JPA 2, Second Edition. 2nd ed. Apress. <http://proquest.safaribooksonline.com/book/programming/java/9781430249269>.
- Das, Vinoo. 2015. Learning Redis. Packt Publishing. <http://proquest.safaribooksonline.com/book/databases/9781783980123>.
- Strauch, Christof, Ultra-Large Scale Sites, and Walter Kriha. "NoSQL databases." Lecture Notes, Stuttgart Media University 20 (2011).
- Carpenter, Jeff, and Eben Hewitt. 2016. Cassandra: The Definitive Guide, 2nd Edition. 2nd ed. O'Reilly Media, Inc. <http://proquest.safaribooksonline.com/book/databases/9781491933657>.



- Robinson, Ian, Jim Webber, and Emil Eifrem. 2015. Graph Databases, 2nd Edition. 2nd ed. O'Reilly Media, Inc. <http://proquest.safaribooksonline.com/book/databases/9781491930885>.
- Agus Kurniawan. 2014. MongoDB Succinctly. <https://www.syncfusion.com/resources/techportal/details/ebooks/mongodb>.

