COURSE DATA

DATA SUBJECT

Code: 44832
Name: Relational and Non-Relational Data Persistence
Cycle: Master's Degree
ECTS Credits: 4
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2234 - Master's Degree in Web Technology, Cloud Computing and Mobile Applications	Escola Tècnica Superior d'Enginyeria	1	Second quarter

SUBJECT-MATTER

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

COORDINATION

CERVERON LLEO VICENTE

GIL PASCUAL MIRIAM

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

Recommendations:

Basic knowledge on relational databases and Java development is required.

COMPETENCES / LEARNING OUTCOMES

2234 - Master's Degree in Web Technology, 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 apply acquired knowledge and solve problems in new or little-known environments within broader and multidisciplinary contexts, being able to integrate this knowledge.

Ability to design and evaluate servers, applications and systems based on distributed computing.

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.

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.

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.

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

PRESENCIAL ACTIVITIES

Activity	Hours
Theoretical and practical classes	28,90
Laboratory	11,10
Total hours	**40,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	6,00
Independent study and work	35,00
Preparation of lessons	16,00
Preparation for assessment activities	3,00
Resolution of case studies	0,00
Total hours	**60,00**

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 assessment systems used in this course are:
SE1: Online assessment and/or level of participation
SE2: Assessment of problems, assignments, reports and/or papers
SE4: In-person assessment
SE6: Assessment of laboratory work

A series of activities will be proposed during the classes, with participation and contributions being assessed (SE1).
A set of laboratory practices will be carried out throughout the course (SE6).
A final project will be proposed and assessed at the end of the course, including a written report and the developed software (SE2), as well as an oral defense before the teaching staff (SE4).

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

Final grade: SE1*0.1 + SE6*0.4 + SE2*0.2 + SE4*0.3

For the second examination session, component SE1 is considered non-recoverable, as it can only be assessed during the teaching period. The other components will be maintained, and improvements to tasks completed during the course may be submitted.

The final project may be submitted and assessed in both examination sessions.

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

- 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.