Course Unit	Distributed Systems			Field of study	Network and Computer Systems								
Bachelor in	Informatics and Communications			School	School of Public Management, Communication and Tourism								
Academic Year	2023/2024	Year of study	3	Level	1-3	ECTS credits	6.0						
Type	Semestral	Semester	1	Code	9188-320-3105-00-23								
Workload (hours)	162	Contact hours	T 15	TP -	PL 45	TC -	S -	E -	OT 20	O -			

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Carlos Filipe Campos Rompante da Cunha

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Develop a global vision on the various aspects of distribution in information systems;
2. Understand, specify, maintain and evolve, distributed architectures using technology support;
3. Develop distributed applications;
4. Mastering the key technologies in support of the distribution;
5. Look to critical distributed patterns;
6. Set, explore, refine and implement distributed systems;
7. Creating centralized systems branch extensions and / or integration with other systems.

Prerequisites

Before the course unit the learner is expected to be able to:
1. Have solid knowledge of object oriented programming.
2. Have knowledge of interfaces and communication protocols.

Course contents

The unit focuses on curricular aspects of the main distribution systems, such as understanding the areas of Distributed Systems, understand the need for interoperability of information systems, distributed software development solutions. There are also considered some of the development key technology such as Sockets, Brokers, RPC, RMI and Web Services. They also addressed issues of a cross, such as security and for fault tolerance.

Course contents (extended version)

1. Introduction to Distributed Systems;
2. Information Systems interoperation architectures;
3. Data Networks;
4. Communication Programing;
5. Sockets;
6. Brokers;
7. Remote Procedure Call (RPC);
8. Remote Method Invocation (RMI);
9. Web Services;
10. Names;
11. Fault tolerance;
12. Atomic Transactions;
13. Message queues.

Recommended reading

1. MARQUES, J. ; GUEDES , P. (2003). Tecnologia de Sistemas Distribuídos. Editora FCA. ISBN: 978-972-722-128-8
2. BALACHANDARREST B. (2017). RESTful Java Web Services: A pragmatic guide to designing and building RESTful APIs using Java, 3rd Edition. Editora Packt. ISBN: 978-1788294041
3. CARDOSO, J. (2011). Programação de Sistemas Distribuídos em Java. (1ª Edição) Editora FCA. ISBN: 978-972-722-601-6
4. BURNS B. (2018). Designing Distributed Systems: Patterns and Paradigms for Scalable, Reliable Services. Editora O'Reilly. ISBN: 978-1491983645

Teaching and learning methods

Lectures: Presentation and discussion of the matter. Presentation of some examples / demos. Practical Laboratorial classes: carrying out the practical application of concepts presented in lecture classes.

Assessment methods

1. Final Assessment - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 50% (Minimum score of 7.0 values)
   - Practical Work - 50% (Minimum score of 7.0 values)
2. Incoming students in mobility programs - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 50% (Minimum score of 7.0 values)
   - Practical Work - 50% (Minimum score of 7.0 values)

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Carlos Filipe Campos Rompante da Cunha	Vítor José Domingues Mendonça	Anabela Neves Alves de Pinho	Luisa Margarida Barata Lopes
06-11-2023	06-11-2023	07-11-2023	09-11-2023