

Informatique

Distributed System and Middleware Design

IDENTIFICATION

CODE : IST-4-MID
ECTS : 3.0

HOURS

Lectures : 0.0 h
Seminars : 20.0 h
Laboratory : 0.0 h
Project : 0.0 h
Teacher-student
contact : 20.0 h
Personal work : 20.0 h
Total : 40.0 h

ASSESSMENT METHOD

Projects

TEACHING AIDS

TEACHING LANGUAGE

English

CONTACT

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AIMS

This course focuses on the design and implementation of common middleware families as found in real-world distributed application architectures. We tackle the challenges addressed by middleware design through both the prism of classical distributed systems problems as well as the techniques used to simplify programming models.

Students will acquire useful knowledge in the age of cloud computing as a target of choice for building innovative products. Indeed, they will understand key elements in the design of popular frameworks, and they will learn about the common pitfalls of distributed systems.

CONTENT

- * Introduction
- * Concurrent programming
- * Lock-free concurrent programming
- * Aspect-oriented programming
- * Component container design and usage
- * Comparing distributed events with logical and vector clocks
- * Consensus algorithms

BIBLIOGRAPHY

- [1] Andrew S Tanenbaum, "Distributed Operating Systems", Prentice-Hall
- [2] Sape Mullender, "Distributed Systems", Addison-Wesley
- [3] Clemens Szyperski with Dominik Gruntz and Stephan Murer, "Component-Software Beyond Object-Oriented Programming"
- [4] Richard Monson-Haefel, "Enterprise JavaBeans", O'Reilly
- [5] Gregor Hoppe, Bobby Woolf, "Enterprise Integration Patterns: Designing, Building, and Deploying Messaging Solutions", Addison-Wesley

PRE-REQUISITE

Java, networks, operating systems