# SYSTEMS INTEGRATION 2022-23



# DEGREE CURRICULUM SYSTEMS INTEGRATION

Coordination: GIMENO ILLA, JUAN MANUEL

Academic year 2022-23

# SYSTEMS INTEGRATION 2022-23

# Subject's general information

Subject name	SYSTEMS INTEGRATION						
Code	102057						
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION						
Typology	Degree		Course	Character		Modality	
	Bachelor's Degree in Computer Engineering		4			Attendance- based	
	Bachelor's Degree in Computer Engineering4OPTIONA		TIONAL	Attendance- based			
Course number of credits (ECTS)	9						
Type of activity, credits, and groups	Activity type	ctivity PRALAB			TEORIA		
	Number of credits	3.6		5.4			
	Number of groups	1			1		
Coordination	GIMENO ILLA, JUAN MANUEL						
Department	COMPUTER SCIENCE AND INDUSTRIAL ENGINEERING						
Teaching load distribution between lectures and independent student work	40% lectures; 60% student work						
Important information on data processing	Consult this link for more information.						
Language	Catalan (classnotes in english)						
Distribution of credits	Juan Manuel Gimeno IIIa (9)						

# SYSTEMS INTEGRATION 2022-23

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention	
GIMENO ILLA, JUAN MANUEL	juanmanuel.gimeno@udl.cat	9	By appointment	

## Subject's extra information

Knowledge of Java, Data Bases and Web Applications is assumed to properly follow the subject.

# Learning objectives

The main objective of this subject is to introduce the functional paradigm for the design of applications

So,

- We will present the Scala programming language, which integrates both object-oriented and funcional paradigms
- We will present the main concepts of functional programming
- We will introduce the ZIO framework and some libraries based on it
- We will analyse the architecture and design of some applications

## Competences

#### Strategic competences of the UdL

- CT1: Mastering a foreign language, especially English.
- **CT2**: Training Experience in the use of the new technologies and the information and communication technologies.

#### Cross-disciplinary competences

• EPS11: Capacity to understand the needs of the user expressed in a no technical language.

#### Specific competences

- **GII-IS3:** Capacity to give solution to problems of integration taking into account the strategies, standards and available technologies.
- GII-IS5: Capacity to identify, evaluate and manage the potential risks that can arise.

## Subject contents

- 1. The Scala 3 programming language
- 2. Functional Programming Fundamentals
- 3. The ZIO 2.0 Framework
- 4. Zlo Ecosystem
  - 1. Testing
    - 2. HTTP app server
    - 3. Database access
    - 4. Streaming
- 5. Study of Applications

# Methodology

#### Theory / Laboratory sessions:

- The main theoretical concepts are presented, but always working on practical examples
- · We'll use some videos with presentations and tutorials
- We'll practice the cpncepts presented in theory on
- · We'll analyze the code and structure of existing projects
- · Live-programming sessions on simplifications of the linraries we'll use

#### Autonomous work:

- Programming on practice exercises
- Reading of additional materials
- Viewing of additional videos

# Development plan

Week	Contents		
1	Presentation + Scala 3		
2	Scala 3		
3	Functional Programming Fundamentals		
4	Functional Programming Fundamentals		
5	Functional Programming Fundamentals		
6	Functional Programming Fundamentals		
7	The ZIO 2.0 Framework		
8	The ZIO 2.0 Framework		
9	First midterm		
10	zio-test		
11	zio-http		
12	zio-jdbc		
13	zio-stream		
14	Analysis of applications		
15			
16	Second midterm		
17	Second midterm		

NOTE: As tha main of the syllabus has been modified, this planning is provisional at the time of configuring this guide.

### **Evaluation**

- Two midterms, about basic concepts (short answers), 10% of final grade each one
- Four projects using different techniques and libraries: 20% each

# Bibliography

- Paul Chiusano, Rúnar Bjarnason, Functional Programming in Scala, Manning (2015)
- Martin Odersky, Lex Spoon, Bill Venners and Frank Sommers, <u>Programming in Scala (Fifth Edition)</u>, Artima (2021)
- Debasish Ghosh, Functional and Reactive Domain Modeling, Manning (2017)