

Course Unit	Software Engineering		Field of study	Information Systems	
Bachelor in	Informatics Engineering		School	School of Technology and Management	
Academic Year	2021/2022	Year of study	2	Level	1-2
Type	Semestral	Semester	2	ECTS credits	6.0
Workload (hours)		162	Contact hours	T 30   TP -   PL 30   TC -   S -   E -   OT -   O -	
Code 9119-706-2204-00-21					

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) José Eduardo Moreira Fernandes

#### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Understand the context, fundamental concepts, and knowledge areas of Software Engineering
2. Recognize the importance and understand the fundamentals of modeling, processes, tools, and standards in software development
3. Recognize the importance and understand the fundamentals of software requirements engineering
4. Possess fundamental skills in methodologies, tools, and techniques for object-oriented development of software systems
5. Understand and use the UML modeling language

#### Prerequisites

Before the course unit the learner is expected to be able to:

1. Have skills on reading and understanding English.
2. Have knowledge on programming.

#### Course contents

Software Engineering Fundamentals. Software development process fundamentals. Software Requirements Engineering. Software-based systems modeling.

#### Course contents (extended version)

1. Software Engineering Fundamentals
  - The importance, difficulties, and challenges of software development
  - Knowledge areas of Software Engineering
2. Software development process fundamentals
  - Development process fundamentals and contemporary methodological approaches
  - Models and modeling languages
  - Major tools and standards
3. Software Requirements Engineering
  - Definition and type of requirements
  - Requirements engineering process
  - Techniques and models
4. Software-based systems modeling
  - UML overview
  - Use case diagrams
  - Object and Class diagrams
  - Activity diagrams
  - State machine diagrams
  - Sequence diagrams

#### Recommended reading

1. Martina Seidl, Marion Scholz, Christian Huemer, and Gerti Kappel, "UML@Classroom", Springer, 2012.
2. João Fernandes e Ricardo Machado, "Requirements in Engineering Projects", Springer, 2016.
3. Henrique O'Neil, Mauro Nunes e Pedro Ramos, "Exercícios de UML", FCA, 2010.
4. Mike O'Docherty, "Object-Oriented Analysis and Design Understanding System Development with UML 2. 0", John Wiley & Sons, 2005.
5. Jim Arlow, and Ila Neustadt, "UML 2 and the Unified Process (2nd Edition)", Pearson Education, 2005.

#### Teaching and learning methods

The unit will be taught using lectures exposing theoretical concepts, practice classes for problem solving, and teacher-oriented self learning.

#### Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
  - Practical Work - 30%
  - Intermediate Written Test - 70%
2. Alternative 2 - (Regular, Student Worker) (Supplementary)
  - Practical Work - 30% (The works considered are those carried out and evaluated during the semester.)
  - Final Written Exam - 70%
3. Alternative 3 - (Regular, Student Worker) (Special)
  - Final Written Exam - 100%

#### Language of instruction

1. Portuguese
2. English

## Electronic validation

José Eduardo Moreira Fernandes	José Luís Padrão Exposto	Luísa Maria Garcia Jorge	Paulo Alexandre Vara Alves
08-03-2022	12-03-2022	22-03-2022	25-03-2022