ipb
INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Software Engineering			Field of study	Information Systems	
Bachelor in	Informatics Engineering			School	School of Technology and Management	
Academic Year	2022/2023	Year of study	2	Level	1-2	ECTS credits	6.0
Type	Semestral	Semester	2	Code	9119-706-2204-00-22	

Workload (hours)	162	Contact hours	T	30	TP	-	PL	30	TC	-	S	-	E	-	OT	-	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)	Isabel Maria Lopes, 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 of modeling, of processes, and tools in software development
3. Understand the typical phases and tasks of a software development process
4. Possess fundamental skills on 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

Context and general concepts of Software Engineering. Object-oriented (OO) paradigm. Modeling languages in the development of software systems. Software development processes and methodologies. Software requirements engineering. Construction of models in software development.

Course contents (extended version)

1. Fundamentals of Software Engineering
    - Complexity and engineering in software development
    - Software Engineering knowledge areas
    - International organizations and information sources
2. Fundamentals of software development
    - Models and modeling languages
    - CASE Tools
    - Process models of software development
3. Software modeling with UML
    - UML overview
    - Major UML diagrams for functional, structural, and behavioral modeling
4. Complementary topics of Software Engineering
    - Contemporary methodological approaches
    - Software requirements engineering

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. IEEE Computer Society, "Software Engineering Body of Knowledge (SWEBOK)". Available at https://www.computer.org/education/bodies-of-knowledge/software-engineering

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 - 25%
    - Intermediate Written Test - 75%
2. Alternative 2 - (Regular, Student Worker) (Supplementary)
    - Practical Work - 25% (The works considered are those carried out and evaluated during the semester.)
    - Final Written Exam - 75%
3. Alternative 3 - (Regular, Student Worker) (Special)
    - Final Written Exam - 100%

Language of instruction

1. Portuguese
2. English

Electronic validation

Isabel Maria Lopes, José Eduardo Moreira Fernandes	José Luís Padrão Exposto	Luísa Maria Garcia Jorge	José Carlos Rufino Amaro
08-03-2023	17-03-2023	27-03-2023	27-03-2023