INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Software Engineering			Field of study	Information Systems		
Bachelor in	Management Informatics			School	School of Technology and Management		
Academic Year	2022/2023	Year of study	2	Level	1-2	ECTS credits	6.0
Type	Semestral	Semester	1	Code	9186-709-2103-00-22		

Workload (hours)	162	Contact hours	T 30	TP 30	PL -	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): 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. Context and general concepts of Software Engineering
   - The importance, difficulties, and challenges of modeling software systems
   - Knowledge areas of Software Engineering
   - International organizations and standards
2. Modeling languages in the development of software systems
   - Modeling languages
   - The UML language: overview
   - Major UML diagrams and elements for functional, structural, and behavioral modeling
3. Software development processes and methodologies
   - Fundamental concepts
   - Process models
   - Contemporary methodological approaches
   - Software Requirements Engineering
4. Construction of models in software development
   - Integration of models in the development process
   - CASE Tools

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 - 20%
   - Intermediate Written Test - 80%
2. Alternative 2 - (Regular, Student Worker) (Special)
   - Final Written Exam - 100%
3. Alternative 3 - (Regular, Student Worker) (Supplementary)
   - Practical Work - 20%
   - Final Written Exam - 80%

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

José Eduardo Moreira Fernandes	José Luís Padrão Exposto	José Carlos Rufino Amaro	Paulo Alexandre Vara Alves
14-10-2022	24-10-2022	24-10-2022	24-10-2022