

Course Unit	Software Engineering I	Field of study	Information Systems
Bachelor in	Informatics and Communications	School	School of Public Management, Communication and Tourism
Academic Year	2022/2023	Year of study	2
Type	Semestral	Semester	1
Level	1-2	ECTS credits	6.0
Code	9188-320-2104-00-22		
Workload (hours)	162	Contact hours	T - , TP 30, PL 30, TC - , S - , E - , OT 20, 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) Vítor José Domingues Mendonça

### Learning outcomes and competences

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

1. Acquire and apply knowledge and techniques for analysis of requirements for information systems;
2. Develop a system model for their complementary visions: functional, data, and behavior;
3. Know and Use tools from software engineering (CASE tools - Computer-Aided Software Engineering);
4. Have the knowledge of the Project Management Software.

### Prerequisites

Before the course unit the learner is expected to be able to:  
Not applicable

### Course contents

- Software Project Management; - System Development; - Specification information systems; - Structured Analysis; - CASE Tools; - Architectural Design Software Systems; - Testing and Implementation.

### Course contents (extended version)

1. Software Project Management.
2. System Development
  - SD Paradigms: Waterfall Model, V Model; Prototyping; Exploratory Programming; Spiral Model
  - Models
  - Tools
3. Technics of Requirements Identification
  - Documentation analysis
  - Interviews
  - Questionnaires
  - Direct observation
4. Structured analysis
  - Different analysis perspectives
  - Process oriented model DFD; IDEF0 diagram; data dictionary; structured language; decision tables;
  - Data oriented model: entity relation diagram; normalization
  - Behaviour oriented models: transition state diagram (DTE)
5. CASE tools
6. Design
7. Tests and implementation

### Recommended reading

1. Mendonça, V. (2021). *Sebenta da disciplina de Engenharia de Software*. IPB, EsACT.
2. Maalej, W. , Thurimella, A. (2013). *Managing Requirements Knowledge*. Springer. ISBN: 978-3642344183
3. Pressman, R. , Maxim, B. (2016). *Engenharia de Software: Uma Abordagem Profissional*. 8ª ed. McGraw-Hill. ISBN: 9788580555332
4. Thayer, R. , Dorfman, M. (2012). *Software Engineering Essentials*. Volume I, Volume II e Volume III. Software Management Training. ISBN: 978-0985270704; 978-0985270711; 978-0985270728
5. Sommerville, I. (2010). *Engenharia de Software*. Pearson. ISBN: 9788579361081

### Teaching and learning methods

Contact Hours: Exposure of theoretical concepts and guidance in the use of CASE tools; Application of knowledge to solve problems; Discussion of case studies. Not presental Hours: Elaboration of practical work (individual or group); Research, analysis and study of documentation; Exploration and Use of Tools CASE.

### Assessment methods

1. Distributed Evaluation - (Regular, Student Worker) (Final, Supplementary, Special)
  - Case Studies - 20% (Continuous Evaluation: presence and effort on project resolution are considered.)
  - Practical Work - 45% (Practical group work: Structured Modeling of an Information System. (Evaluation Minimum mark >= 8/20))
  - Final Written Exam - 35% (Individual evaluation of skills and knowledge acquired. (Evaluation Minimum mark >= 8/20))
2. Not Aplicable - (Student Worker) (Final, Supplementary, Special)
  - Laboratory Work - 20%
  - Practical Work - 45%
  - Final Written Exam - 35%

### Language of instruction

Portuguese, with additional English support for foreign students.

## Electronic validation

Vítor José Domingues Mendonça	Vítor José Domingues Mendonça	Elisabete da Anunciacao Paulo Morais	Luisa Margarida Barata Lopes
09-10-2022	09-10-2022	10-10-2022	16-10-2022