

Course Unit	Construction Management	Field of study	Construction Management and Legislation		
Bachelor in	Civil Engineering	School	School of Technology and Management		
Academic Year	2023/2024	Year of study	3	Level	1-3
Type	Semestral	Semester	2	ECTS credits	6.0
Code	9089-322-3203-00-23				
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) Jorge Pedro Lopes

#### Learning outcomes and competences

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

1. Analyse and apply different techniques and methods for the selection and efficient utilization of construction plant and equipment.
2. Understand the principles and techniques for the planning and organization of site layout.
3. Apply, analyse and measure a range of components and elements found in building and civil engineering works.
4. Analyse and apply different techniques for the planning of construction projects and construction works.
5. Understand and clearly identify direct and indirect costs incurred on construction projects.
6. Understand the legal framework of the construction industry

#### Prerequisites

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

1. Demonstrate knowledge on the basics of Calculus, Trigonometry and Statistics.
2. Demonstrate knowledge of Construction Materials and Construction Technology.
3. Demonstrate knowledge of Technical Drawing.

#### Course contents

The construction industry and the national economy. New construction and R&M works. Project planning and project scheduling. Principles of planning and scheduling. Planning techniques. Construction plant and equipment. Planning and organisation of site layout. Budgeting. Measurement techniques. Estimating techniques. Owner's estimate for the construction phase. Contractor's own costs. Payment. Project completion. Introduction to the legal framework of the construction industry- the Code of Public Contracts.

#### Course contents (extended version)

1. The general and legal contexts of the construction industry
  - The specificity of the construction industry. New construction and R&M works.
  - The nature of construction projects. The owner, consultants, supervising entities, contractors.
  - Introduction to the legal framework of the construction industry;
2. Plant and equipment management
  - Construction plant and equipment.
  - Selection of plant and equipment
  - Cost of plant and equipment
  - Methods of depreciation.
  - Financing of plant and equipment: outright purchase; hire purchase; leasing.
3. Site layout
  - Regulations on site works.
  - Planning and organisation of site layout. Installations and equipment on site
4. Planning and Scheduling
  - Introduction to project planning and project scheduling. Objectives and principles of planning.
  - Planning techniques. Work breakdown structures (WBS), GANTT diagrams.
  - Network analysis systems: Critical Path Method (CPM); Project Evaluation and Review Technique- PERT.
  - Resource allocations for construction works.
5. Budgeting
  - Measurement and measurement techniques. Estimating techniques.
  - Cost and prices. Information on costs.
  - Owner's estimate for the construction phase.
  - Contractor's own costs. Direct costs. Indirect costs. Overhead. Profit.
6. Payment
  - Contract pricing formats. Payment in construction contracts. The S curve.
  - Work certificates.
  - Variations. Fluctuations. Retention money.
7. Project completion
  - Final inspection. Preliminary and final possession. Certificate of completion. Guarantees.

#### Recommended reading

1. A. Costa Manso, M. Santos Fonseca, J. Carvalho Espada - Informação sobre Custos - Laboratório Nacional de Engenharia Civil, Lisboa 2007.
2. Reis, A. Correia; Organização e Gestão de Obras; edições técnicas E. T. L. ; Lisboa, 2012
3. Project Management for Engineering and Construction, Garold D. Oberlander, McGrawHill.
4. Peurifoy, Robert; Schexnayder, Cliff Shapira, Aviad; Construction Planning, Equipmentand Methods, seventh edition; McGraw-Hill; 2006
5. INCM - O Código dos Contratos Públicos- Decreto- Lei 18/2008, Lisboa

#### Teaching and learning methods

The course unit will be taught through a combination of lectures, practical classes aimed at the resolution of practical exercises and development of an individual/group project.

#### Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final, Supplementary)
  - Final Written Exam - 25%
  - Practical Work - 75% (This method includes the presentation and discussion of individual/group works)

**Assessment methods**

2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100%
3. Alternative 3 - (Regular, Student Worker) (Final, Supplementary)
  - Practical Work - 100% (This method includes the presentation and discussion of the works and topics of the curricular unit)

**Language of instruction**

Portuguese, with additional English support for foreign students.

**Electronic validation**

Jorge Pedro Lopes	Flora Cristina Meireles Silva	António Miguel Verdelho Paula	José Carlos Rufino Amaro
17-03-2024	17-03-2024	20-03-2024	24-03-2024