

## Course file

<b>Study cycle</b>	BACHELOR IN CIVIL ENGINEERING		
<b>Course</b>	GENERAL DRAWING	Mandatory	<input checked="" type="checkbox"/>
		Optional	<input type="checkbox"/>
<b>Course scientific area</b>	CIVIL ENGINEERING	Category	B

Course category: B - Basic; C - Core Engineering; E - Specialization; P - Complementary.

Year: 1st	Semester: 1st	ECTS: 4,0		Total: 108
Contact time	T:	TP: 45	PL:	S:
				OT:

T - Lectures; TP - Theory and practice; PL - Lab Work; S - Seminar; OT - Tutorial Guidance.

Course Director	Title	Position
Carlos Penim Loureiro	Doutor	Professor Adjunto

### Learning objectives (knowledge, skills and competences to be developed by students)

(max. 1000 characters)

1. Minimum set of knowledge to the field of technical design of civil engineering and architecture.
2. Confers capacity to the interpretation, execution and management of drawings of a construction project.
3. Acquires three-dimensional perception based on only in two-dimensional graphics, essential in calculating structural design of the infrastructure or the construction site technical management.

### Syllabus

(max. 1000 characters)

1. UP-RATED GEOMETRY: GENERAL CONCEPTS; THE POINT, LINES AND PLANS. CUTS, GEOMETRICAL FIGURES (2D AND 3D). PRATICAL APPLICATIONS ON CIVIL ENGINEERING.
2. DESCRIPTIVE GEOMETRY: GENERAL CONCEPTS; INTRODUCTION TO THE PROJECTION WITH A LATERAL PLAN; THE POINS, LINES AND SPECIAL PLANS.
3. ALTIMETRIC SISTEM: GENERAL CONCEPTS; INTRODUCTION TO THE PROJECTION WITH A SINGLE HORIZONTAL PLAN; THE POINS, LINES AND SPECIAL PLANS. GEOMETRICAL FIGURES (2D AND 3D). PRATICAL APPLICATIONS ON CIVIL ENGINEERING.

**Demonstration of the consistency between the syllabus and the course objectives**

(max. 1000 characters)

Chapter 1 of the program provides a set of information that will enable the student, both during their training or research, as well as in professional life opt for various types of graphic representation of engineering design. This chapter was established as the minimum set of knowledge to the field of technical design of civil engineering and architecture, basic training to enable the development of new skills with courses from the following semesters.

In Chapters 2 and 3 of the program the student is given an analytical tool and methodology applicable representation of any object, particularly directed at building. Through the field of projection systems are developed, not only skills in the interpretation, execution and management of drawings of the construction project, but especially the three-dimensional reasoning skills based on only two-dimensional graphics.

**Teaching methodology (evaluation included)**

(max. 1000 characters)

Classes are Theoretical-practical. The program developed several lines are present in the elements of teaching aids, which contain a summary of theoretical material and exercises always resolved. All the theoretical exposition of the methodology is framed by practical context, using volumes and exercises that relate to the world of construction and their communication needs and determine formal and dimensional data.

Students develop a set of practical exercises or accompanying statements made by the teacher or with the support of the timely resolution of issues and problems in class or outside of them in tutoring.

DURING CLASSES AVALUATION: 4 Descriptive Geometry Exercises + 2 Altimetric Sistem Exercises + 1 final assessment

ASSESSMENT: 2 Final Exams

**Demonstration of the consistency between teaching methodology and the course learning objectives**

(max. 3000 characters)

The course objectives are achieved mainly by the practical teaching methodology for printed: Students are encouraged to constructive graphical representation of areas which are usually subject to errors reading / interpretation during the analysis of the project or work. This practice allows students to experience itself, the purest strains and general methods best suited to expose their data construction, and formal dimensions, a rigorous and unambiguous.

Capacity is acquired in the interpretation, execution and management of drawings of the construction project, as well as the three-dimensional reasoning skills, through direct experience designing and executing in order to make it clear and legible for others.

### Main Bibliography

(max. 1000 characters)

- ALBUQUERQUE, Luis de: Elementos de Geometria Projectiva e Geometria Descritiva, Almedina, 1969.
- CHING, F: Manual de Dibujo Arquitectónico, Barcelona, Gustavo Gili, 1976.
- SOUSA, Pedro Fialho de: Textos de Apoio de Geometria Descritiva do 12º Ano Unificado, Vol I e II
- KRYLOV, N, Lobandievki, P, Maine, S: Descriptive Geometry, Moscow, Mir, 1971.
- ASENSI, Fernando Izquierdo: Geometria Descritiva Superior e Aplicada, Ed. Dossat, Madrid
- ASENSI, Fernando Izquierdo: Geometria Descritiva, Ed. Paraninfo, Madrid, 1993.
- PINHEIRO, Carlos Silva, SOUSA, Pedro Fialho de: Desenho, Volume I e II, coleção Textos Pré-Universitários Secretaria de Estado do Ensino Superior, 1979.