

**Curricular Unit Form (FUC)**

Course:	<b>FIRST CYCLE IN MECHANICAL ENGINEERING</b>					
Curricular Unit (UC)	<b>Technical Drawing</b>				Mandatory	<b>X</b>
					Optional	
Scientific Area:	<b>Mechanical Design, Manufacturing and Industrial Maintenance</b>					
Year: <b>1</b>	Semester: <b>1</b>	ECTS: <b>3,0</b>		Total Hours: <b>3,0</b>		
Contact Hours:	T:	TP: <b>45</b>	PL:	S:	OT:	TT: <b>45</b>
Professor in charge		Academic Degree /Title		Position		
<b>Luís Manuel Vicente Ferreira</b>		<b>Doctor</b>		<b>Professor Coordenador</b>		

T- Theoretical ; TP – Theory and practice ; PL – Laboratory ; S – Seminar ; OT –Tutorial ; TT – Total of contact hours

Entry into Force	Semester: <b>Winter</b>	Academic Year: <b>2020/2021</b>
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<b>Objectives of the curricular unit and competences</b> (max. 1000 characters)
<p><b>objectives:</b></p> <p>Distinguish between drawing and artistic design;</p> <p>Recognizing the need to learn technical drawing as a form of communication;</p> <p>Learning Descriptive Geometry concepts required for the technical design;</p> <p>Develop the ability to run the technical outline of mechanical components.</p> <p>Sketch mechanical components using technical-teaching models.</p> <p><b>skills:</b></p> <p>Apply Descriptive Geometry concepts in parts production simulation exercises.</p> <p>Knowing the general principles of design of mechanical engineering, in order to know transform a 3D part in a drawing in multiple views 2D.</p> <p>Sketch parts in three dimensions from technical and didactic models,</p> <p>Know and apply the rules in 2D dimensioning drawings.</p> <p>View and interpret the projections of parts and mechanical construction sets;</p> <p>Represent, in outline, machine parts in the necessary and sufficient projections, including cuts and dimensioning;</p> <p>Apply rules of Technical Drawing.</p>

**Syllabus** (max. 1000 characters)

1. INTRODUCTION: The importance of Descriptive Geometry in Technical Drawing applications;
2. Study the point, the line and the plane. Interconnection of these parameters;
3. Orthogonal projections of plane figures and solids;
4. Standardisation Technical Drawing;
5. Solid cuts and true magnitudes of the sections;
6. Dimensioning;
7. Sketches 2D and 3D;
8. Applications with solid models.

**Demonstration of the syllabus coherence with curricular unit's objectives** (max. 1000 characters)

The technical drawing is one of the main means of communication of Mechanical Engineers. For this reason students should learn from an early age, the basic rules of Technical Drawing, their reading and interpretation. They should also learn how to represent parts/component to be understood by all participants in the production process.

Throughout the lessons the required content with the achievement of specific objectives described will be administered, especially for the better use of educational models. In practical classes students will be monitored throughout its work to ensure the acquisition of the skills required.

**Teaching methodologies (including evaluation)** (max. 1000 characters)

The teaching method provides training in appropriate laboratory, the theoretical and practical components, using the bibliography in support of this course, the PowerPoint presentations, the Moodle platform and supplementary materials to support the study. In practice component, students undertake the development and resolution of specific cases, with the direct support of teachers, without disregarding the technical and pedagogical components.

The assessment includes:

A practical work or examination test (60% of final grade) and holding various pedagogically fundamental practical work. The works performed and considered for evaluation represent 40% of the final grade.

**Demonstration of the teaching methodologies coherence with the curricular unit's objectives**

(max. 3000 characters)

During the lectures will be given all the content necessary for acquisition of knowledge by students. This means that all theoretical objectives will be presented during this component.

The teaching method in the Course of DT is fully directed to the objectives to be achieved; students will start by attending an appropriate set of lectures with PowerPoint presentations, where the basics (projections, perspectives, dimensioning, standardization, etc.) will be given in order to enable a correct interpretation of technical drawings and the further development of own drawings of different parts to represent. The use of Moodle allows students to follow the development of materials and the realization of autonomous work. The classes, in greater number than the theoretical, shall be accompanied by their teachers will enable the rapid understanding and application of theoretical concepts so that students can quickly start drawing according to the method presented during the lectures.

In practical classes will be presented works that will be performed by students under the direct guidance of the teacher, analyzing the structural and technical content of the same, in view of achieving the objectives set for the course.

**Main Bibliography** (max. 1000 characters)

Morais, S. (2006) *Desenho Técnico Básico (Vol. 3)* – Porto Editora  
Silva, A. et al (2004) *Desenho Técnico Moderno* – LIDEL  
*Normas Portuguesas sobre Desenho Técnico* – IPQ – Lisboa  
Ornelas, Alberto; Ribeiro, José; Silva, Manuel – *Desenho e Geometria Descritiva. Desenho Técnico* – Edições ASA, S.A. Porto  
- VEIGA DA CUNHA, L. - *Desenho Técnico*. Lisboa: F.C. Gulbenkian. 11ª edição. 1999.