

MECHANICAL DRAWING (CAD)

Code: 332001

Main Scientific Area: Mechanics and industrial processes

Lecturer: Fernando José da Silva Veloso

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 60h Total Workload: 105h

ECTS: 6,0

Objectives

Interpret and implement part and assembly drawings.

3D modeling and 2D technical drawings in CAD software.

Perform functional dimensioning of parts.

Define general tolerances.

Recognize and characterize the ISO system of tolerances.

Specify dimensional tolerances.

Select assembly adjustments in typical conditions.

Interpret geometric tolerances.

Specify the surface state under typical conditions.

Know and use standardized components, their schematic and simplified representation.

Learning Outcomes

Understanding of the operation and use of CAD systems.

2D and 3D modeling of parts and assemblies

Use of standard components from databases from the CAD system and from the Internet

Design parts and assemblies for production, taking into account:

Materials, manufacturing, assembly and operation.

Course Contents

Standard Components

Standard Subassemblies

Threaded connections

Fixed connections

Dimensioning

Dimensioning shape / position of dimensioning
Nominal dimensioning / functional dimensioning
General tolerancing
Types of tolerance
Build quality
General tolerances - castings
General tolerances - machined parts
General tolerances - parts with welding
Specific dimensional tolerancing
Symbology on dimensional tolerancing
Tolerance of dimensions
ISO system of tolerances
Adjustments
ISO adjustments system bore and the shaft Normal
Selection adjustments / recommended adjustments
Specific geometric tolerancing
Symbology in geometric tolerancing: form; guidance; position; beat.
Surface condition
Characteristics of surfaces
General roughness
Specific roughness
Selection roughness
Relations roughness / tolerance / technological process
Functional design analysis of mechanical systems

Creating technical drawings

Recommended Bibliography

Morais, José Manuel de Simões; Desenho técnico básico. ISBN: 972-96525-2-X

Cunha, Luís Veiga da; Desenho Técnico ISBN: 9789723110661

Guia do Aluno de CAD, Soliworks, documento PMS0122-PTB

Learning and Teaching Methods

Practical work in class simulates the activity in the workplace , by performing the tasks described in the objectives of this course .

Assessment Methods

Approval rating for > 9.5

No. credits : 6

Weighted average of:

Attendance(10%)

Work in class and homework (30%)

Mini test 1 (30%)

Mini test 2 (30%)