DESIGN OF MECHANICAL CONSTRUCTION

Code: 16140

Main Scientific Area: Health, Environment and Industrial Technologies

Lecturer: Joana Maria Marques Vale

Language of Instruction: Portuguese

Regime: S2

Contact Hours: 60h Total Workload: 40h

ECTS: 4,0

Objectives

The students should be able to:

Read technical drawings in orthographic representation and make the corresponding representations;
Understand the meaning of tolerances in drawings;
Identify different mechanical components;
Know how shoud be done the representation in drawing and what are the mechanical functions;
Modeling and preparing drawings of parts and do assemblies using CAD programs.
Rendering and animate in CAD program.

Learning Outcomes

The ability to create technical drawings of components and assemblies using CAD softwares.

Course Contents

1. Introduction to Technical Drawing

2. Projection and orthographic representation in AutoCAD:

a. View selection

b. Cuts and sections

3. Axonometric representation (Isometric drawings):

4. Introduction to Modeling with Solidworks:

a. Enumerate the main characteristics of a parametric model based on operations;

b. Distinguish between applied and sketched operations;

c. Identify the available commands in the Solidworks interface;

d. Understand different methodologies and than defining dimensions lead by different project.

e. Create a new part;

f. Insert a new sketch;

g. Add a sketch of a geometric shape;

h. Establish relationships between sketch and geometric parts;

i. Understand the state of a sketch;

j. Use sketch tools to add chamfers and fillets;

k. Turn the sketch into a solid;

l. Choose the best profile for sketches;

m. Choose the appropriate sketch plane;

n. Extrude a sketch;

o. Create holes;

p. Insert fillets into a solid;

q. Make a basic drawing of a part;

r. Changing Dimensions: Nominal Dimensioning and Dimensional Tolerance (Part and Assembly);

s. Demonstrate the associativity between the model and the drawing views.

5. Surface finishing (Rendering):

a. Create photorealistic images;

b. Change appearance: materials, colors and textures;

c. Scenery and lighting.

6. Assembly drawings and parts lists:

a. Make the assembly of parts using the constraints;

b. Mechanical connections;

c. Component representation.

7. Submit a mechanical design project.

Recommended Bibliography

Apontamentos das aulas disponibilizados no moodle.

Learning and Teaching Methods

The content of this course will enable the student to acquire a set of skills in the field of technical drawing, more specifically, to execute, read and interpret drawings of parts and assemblies with different purposes.

Assessment Methods

Weighted average of 1 test + 1 assignment.
Each test / assignment has the minimum grade of 8 out of 20.
Students will not be eligible for the exam if they fail the practical component of the UC.