

Sheet course ()

Course	FIRST CYCLE IN MECHANICAL ENGINEERING		
Unit	CAD - Computer Aided Drawing	Mandatory	<input checked="" type="checkbox"/>
		Optional	<input type="checkbox"/>
Unit scientific area	Manufacturing and Mechanical Design	Category	B

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

Year: 1st	Semester: 2nd		ECTS: 4			
Contact time	Total: 108	T:	TP: 45	PL:	S:	OT:

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

Unit Director	Title	Position
Joaquim Infante Barbosa	Habilitation	Professor

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

(max. 1000 characters)

Objectives:

The objectives of Computer Aided Drawing (CAD) are to provide the adequate knowledge on the usage of a computerized tool that will enable students to produce 2D and 3D drawings. This useful knowledge will allow students to improve their performance in subjects done later in the course, such as, Mechanical Construction Drawing and the final Project.

Specific Skills:

CAD allows its users to develop the creation of 3 dimensional parts by means of a computerized tool and the conversion of 3D models in 2 dimensional drawings, in accordance with the existing technical normative. It also allows the optimization of the workflow.

Syllabus

(max. 1000 characters)

INTRODUCTION TO THE 2D SKETCHING: Choice of the best profile; Drawing of the 2D parts sketches; Relations between entities.

CREATION OF 3D PARTS: Three-dimensional modelling; Basic geometric primitives. Parametric, associative and variable characteristics. Practical exercises of 3D parts.

ASSEMBLED PARTS MODELLING: "Mating" parts. Assembled parts; Associative and parametric relations;

Change of properties; Exploded views in 3D; Weld symbols; Import of normalized parts.

PRODUCTION OF TECHNICAL DOCUMENTATION CONCERNING THE DESIGN, PRODUCTION AND ANALYSIS: Standardization. Drafting: Drawings of individual parts and assemblies, the adequate views, the criteria of the insertion of dimensions, tolerances, invisible lines, addition of notes, auxiliary views, sections and detailed views. Relation between 3D and 2D drawings.

Demonstration of consistency of the syllabus with the objectives of the course

(max. 1000 characters)

The presented syllabus includes all issues described in the presented objectives of the curricular unit.

Throughout the classes all necessary contents to achieve the specific objectives described will be given, paying special attention to the software and its best usage.

During practical classes students will be accompanied throughout their work to ensure the acquisition of the required skills.

Teaching methodology (evaluation included)

(max. 1000 characters)

Teaching Methodology:

The teaching methodology is based upon practical exercises. In accordance with the program, the difficulty of the exercises increases during the semester.

Assessment:

The practical exercises (T1, T2 e T3) and the pedagogically fundamental assignment (TF) are the main assessment elements.

Grade = $((T1+T2+T3)/3+2*TF)/3$

Demonstration of consistency of teaching methods with the learning objectives of the course

(max. 3000 characters)

Demonstration of teaching methodologies coherence with curricular unit's objectives is also acknowledge through the evaluation process, which is totally based on practical examination and practical works, and so it becomes mandatory for students to have a big commitment in working with and searching for Mechanical Engineering norms and also for technical data released by mechanical elements manufacturers, so they may demonstrate that they have developed the necessary skills and knowledge.

Main Bibliography

(max. 1000 characters)

CAD Tutorials

Simões, M. DESENHO TÉCNICO BÁSICO - Porto Editora

Silva, A.; Ribeiro, C.; Sousa, L. DESENHO TÉCNICO MODERNO – Lidel

Predabon, E.; Bocchese, C. SOLIDWORKS 2004 - PROJECTO E DESENVOLVIMENTO – Érica

Costa, A. AUTODESK INVENTOR 10 CURSO COMPLETO - FCA

C. António, AUTODESK INVENTOR DEPRESSA E BEM – FCA

Rohleder, E. e Speck H.J. TUTORIAIS DE MODELAGEM 3D – Editora Visual Books

Bibliografy available on Moodle platform

Solidworks and Inventor Tutorials