COMPUTER-AIDED MANUFACTURING

Code: 20902

Main Scientific Area: Health, Environment and Industrial Technologies

Lecturer: Cátia Filipa Veiga Alves

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 30h Total Workload: 130h

ECTS: 6,0

Objectives

Specify a Computer Aided Manufacturing system functional requirements and elements, andrelationship with other subsystems of a manufacturing system.
Define and select Computer Aided Manufacturing system tools
Program a CNC machine tool with a CAD/CAM software
Define performance measures of a CAD/CAM system

Learning Outcomes

The contents of this curricular unit will allow students to acquire a set of skills in the area of computer aided manufacturing systems.

This curricular unit will enable students to learnthe concepts and tools that constitute a computer-aided manufacturing (CAM) system. Students will have knowledge to use a CAD/CAM tool, and definition of basic performance measures of a Computer Aided Manufacturing system.

Course Contents

Computer Aided Design (CAD) System

Computer Aided Manufactuting (CAM) System
Machining system and Manufacturing system

Machine tools movements and coordinate system.

Interoperability of CAD/CAM systems
Computer Integrated Manufacturing (CIM)

Flexible Manufacturing Systems (FMS)

Numerical Control systems
Control architectures: NC, CNC, DNC e AC
Interpolation

Programming languages:

Programming language APT

ISO 6983 (“g” language, G-Code)
Software CAD/CAM

CAD, CAM, e CAD/CAM systems organization and management

Recommended Bibliography

- Apontamentos fornecidos pelo docente.

- Groover, M., Zimmers, E. W. J. R. (1983).CAD/CAM: computer-aided design and manufacturing. Pearson Education.- Makris S., Mourtzis D., Chryssolouris G. (2014) Computer-Aided Manufacturing. In: The International Academy for Production Engineering, Laperrière L., Reinhart G. (eds) CIRP Encyclopedia of Production Engineering.Springer, Berlin, Heidelberg

Learning and Teaching Methods

Exposition of the learning content programmed of the curricula unit Computer AidedManufacturing (CAM) follows structurally the learning objectives, systematically referring the aspects of the contents in relation with the learning objectives.

After the theoretical framework,the student will be faced with the development of a set of practical cases so that they can establish the bridgebetween the theoretical foundation and practical application, having to develop and solve the perception of theobjectives of the curricular unit in a very applicable and real way.

Assessment Methods

Evaluation moments:

A1 – Practical Work/Presentation (Group): 1
A2 – Practical Work (Individual): 2
A3 – Written Test: 1

- Final Grade (FG) calculation:

FG = 1 * 40%* A1 + 2 *15%* A2 + 1 *30%* A3

For a student obtain classification to the curricular unit, it cannot have a grade lower than 8 values in any of theelements of evaluation.
Grade improvement exam consists of a specific written exam designed to evaluate and demonstrate student's competences, and it will include all subjects of this curricular unit and the topics developed in the practical work.The exam only replaces the UC test, being mandatory the delivery of group work and individual work. The student can only go to the exam if he has a minimum grade in the group work. If you do not obtain a minimum grade in the individual work, an exam will be carried out on the component evaluated in the individual work.