Course Unit Description - (SIFFA)

(Flexible Manufacturing Systems)

(Mestrado em Engenharia Electrotécnica e de Computadores)

Academic year: 2009/2010

Subject group: Automação e Robótica

	Semestral	**Optional**		
Mode of study	Diurno	**Hours / Week**	**T-**Teórica	2
			PL-Prática-Laboratorial	2
Year	1º		**OT-**Orientação Tutorial	1
Semester	2º			

ECTS 6

Objectives

This course endows the student with the principal concepts associated to the use of a flexible manufacturing cell and an overall view of flexible manufacturing systems. The laboratory and practice classes are supported by a specialized laboratory.

Course Contents

Theory
Manufacturing Systems
Technical evolution
Basic Concepts
Manufacturing processes
Planning and production organization
Scheduling and production optimization
Computer Integrated Manufacturing (CIM) concept
Flexible Manufacturing Systems (FMS)
Computer Aided Design (CAD)
Computer Aided Manufacturing (CAM)
Computer Numerical Control (CNC)
Industrial Robotics
Industrial systems modeling (Petri Net)
Industrial Networks

Practice
Part design using CAD software
Computer numerical programming examples
Robot programming
Flexible Manufacturing cell programming

Recommended reading

Computer Integrated Manufacturing and Engineering - Rembold
Automation, Production Systems, and Computer Integrated Manufacturing – M. Groover.
Essentials of Numerical Control - Ralph G. Rapello
Automating Manufacturing Systems with PLCs - Hugh Jack
Petri Nets and GRAFCET: Tools for Modelling DES - R. David, H. Alla.
CANopen Implementation: Applications to Industrial Networks - M Farsi.
Teacher supplied Notes

Teaching Methods

Theoretical classes:
- Presentation of theoretical subjects by the teacher using PowerPoint slides.
Tutorial classes:
- Support to a research work developed by a group of three or four students.
Laboratory classes:
- Practice application of the concepts acquired in the theoretical lessons. It will be proposed a set of exercises related to CAD, CNC, Robotics and Petri Nets.

All supporting material will be available in the ISEP e-learning platform Moodle.

Assessment methods

The assessment of the course is divided into two parts: continuous assessment and exams assessment.

The continuous assessment is dived in two parts: theoretical and laboratorial. The theoretical part has a weight of 30%, and the laboratorial a weight of 70% in the grade of continuous assessment.

The continuous assessment will have a weight of 50% in the grade of the final classification.
The exams assessment corresponding to a written exam will have a weight of 50% in the grade of the final classification.

The course grade improvement is made through the realization of a written exam.

	Name
Teacher responsible:	Lino Manuel Baptista Figueiredo (LBF)

Lecturer:	Lino Manuel Baptista Figueiredo (LBF)