Course Unit Description - (MCSDI)

(Modelling and Control of Dynamic Systems)

(Mestrado em Engenharia Electrotécnica e de Computadores)

Academic year: 2009/2010

isep

Subject group: Automação e Robótica

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

ECTS   6

Objectives

The technological developments of the last decades require the knowledge of modern control systems theory. In this perspective, the objectives of the course are to give some insight into nonlinear systems, state-space methods and discrete-time control systems

Course Contents

1. Review of Classical systems theory
2. Nonlinear systems
2.1. Describing function
2.2. Phase space
3. System analysis in the state space
4. Z-Transform and its application to system theory
5. Discrete-time system analysis

Recommended reading

[1] Dynamical Systems and Automatic Control, J.L. Martins de Carvalho, Prentice Hall.
[2] Feedback and Control Systems, J. DiStefano, A. Stubberud e I. Williams, Schaum McGraw-Hill.
[3] Modern Control Engineering, Katsuhiko Ogata, Prentice Hall.
[4] Digital Control Systems: Theory, Hardware, Software, C. Houpis e Gary Lamont, McGraw-Hill.
[5] Digital Control of Dynamic Systems, Gene Franklin, J. Powell and M. Workman.

Teaching Methods

Theoretical classes:
Presentation of the scientific subjects of this course, mainly through the expositive method, but also solving in detail some exercises.

Laboratory classes:
Proposal of some exercises to the students and discussion of doubts that can occur during the resolution of those exercises. Extended solving of some selected exercises of systems theory with the help of MATLAB / Simulink, in order to introduce to the students a possible tool for the study of control systems.

Tutorial classes:
Detailed resolution of selected exercises regarding the subjects addressed in the theoretical classes.

Assessment methods

Continuous assessment:
Continuous assessment based in two mini-exams to occur during selected classes. Each of these mini-exams will cover a part of the course content.
The continuous assessment classification is the average of the classifications obtained in each of the two mini-exams.
In case of missing a mini-exam, the respective classification will be 0.0.

Exam assessment:
Written exam covering all the course content.

Final classification of the course = x.NFREQ + y.PE
x = 0.5; Min NFREQ = 5.0 (minimum continuous assessment)

y = 0.5; Min PE = 5.0 (minimum exam assessment)

The continuous assessment classification and exam classification will be published with decimal values. Rounding will only be done in the final classification values.

Improvement of the course classification:
Through a written exam covering all the course content. The final classification will be the one obtained in this exam.

	Name
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