Course Unit Description - (SIDIH)

(Discrete and Hybrid Systems)

(Mestrado em Engenharia Electrotécnica e de Computadores)

Academic year: 2008/2009

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 3

Objectives

This course intends to provide the theoretical background for the auntonmous sytstem Introduction to discrete and Hybrid Systems Basic Concepts. Methods of analysis, and modelling of discrete systems. Tools of modelling of hybrid systems with continuous and discrete dynamics.
This curricular unit allows to establish the bridge between the classic of control theory and the on areas the computers science.middelling usage, selection, application or development of mobile robots and control architectures for autonomous systems.

Course Contents

introduction to Discrete Event Systems
Controlled Discrete Event Systems
Discrete Event Supervision
Stability
Introduction to Hybrid Systems
Verification of Hybrid Systems
Tools of Simulation

Recommended reading

Hybrid Systems: Computation and Control, C. Tomlin, M. Greenstreet, Editors.
Springer-Verlag, Lecture Notes in Computer Science (LNCS) 2289, 2002.
Introduction to Discrete Event Systems, Christos Cassandras, Stéphane Lafortune, Kluwer Academic Publishers, 1999, ISBN 0-7923-8609-4
Raymond A. DeCarlo, Michael S. Branicky, Stefan Pettersson, Bengt Lennartson, Perspectives and Results on the Stability and Stabilizability of Hybrid Systems , Proceedings of IEEE, Special Issue on Hybrid Systems, July 2000.
Fabian Kratz, Oleg Sokolsky, George J. Pappas, and Insup Lee, R-Charon : a Modeling Language for Reconfigurable Hybrid Systems, Hybrid Systems : Computation and Control, Santa Barbara, CA, March 2006.

Teaching Methods

Assessment methods

	Name
Teacher responsible:	Eduardo Alexandre Pereira da Silva (EPS)
Lecturer:	Eduardo Alexandre Pereira da Silva (EPS) Alfredo Manuel Oliveira Martins (AOM)