Universidad Carlos III de Madrid

DENOMINACIÓN ASIGNATURA DE 3 CRÉDITOS: CONTROL DE PROCESOS			
MÁSTER: INGENIERÍA INDUSTRIAL		COURSE: 1	SEMESTER: 2

SE-SIÓN	DESCRIPTION OF THE CONTENT OF THE SESSION	TIPO (MARCAR CON UNA X)				STUDENT WORK DURING THE WEEK		
		TEORÍA	PRÁCTICAS	LABORATORIO	Indicate Laboratory where it will be taught	DESCRIPTION	PRESENT HOURS	HOURS WORK Maximum Week 7 H
1	Z transform 1. Properties of the z transform 2. Transformed z of some functions 3. The inverse z transform 4. Resolution of equations in differences 5. Operator delay	X	X			Study of the subject taught. Realization of problems.	1,66	1,03
2	Modeling and analysis of systems in the state space 1. Introduction 2. Concept of system status 2.1. Matrix representation of state equations 2.2. Transfer function and representation in the state space	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
3	Modeling and analysis of systems in the state space 3. Representation of systems in the state space 3.1. Conversion of an ordinary differential equation to state equations 3.2. Conversion of an equation into differences to state equations 3.3. Transformations between representations	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
4	Modeling and analysis of systems in the state space 4. Solution of the state equation 4.1. Continuous Time Systems 4.2. Obtaining the solution by the Laplace transform method 4.3. Discretization of the equations of state in continuous time	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
5	4.4. Solution of the state equation in discrete time 4.5. Obtaining the solution by the z transform	X	X			Study of the subject taught. Realization of problems.	1,66	2,84

	method							
6	Examples, exercises and problems	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
7	First evaluation test		X			Realization of problems.	1,66	2,84
8	System control by status feedback 1. Problem statement 1.1. Observable and controllable modes	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
9	System control by status feedback 2. Controllability of a system 2.1. State controllability 2.2. Output controllability	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
10	System control by status feedback 3. Observability of a system 3.1. Full state observability	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
11	System control by status feedback 4. Invariance of controllability and observability 5. Principle of duality	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
12	System control by status feedback 6. Status feedback control 6.1. Systems with scalar input and output 6.2. Adjusting the positions of the poles	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
13	System control by status feedback 6.3. Gain adjustment 6.4. System Type Modification 6.5. Systems with vector input	X	X			Study of the subject taught. Realization of problems.	1,66	2,84
14	System control by status feedback 7. Status observer design 7.1. Full Order Observer 7.2. Joint behavior of the feedback system with the observer	X	X			Study of the subject taught. Realization of problems.		2,84
15	Lab 1. Control in state variables with Matlab			X	Computer Classroom	Report of practices.	1,66	
16	Second evaluation test		X			Realization of problems.	1,66	
						SUBTOTAL	**24,9**	
15	Recuperaciones, tutorías, entrega de trabajos, etc							4,6
16	Recuperaciones, tutorías, entrega de trabajos, etc							4,6
	Examen final						**3**	
						TOTAL	**75 (3 ECTS)**	