SUBJECT TEACHING GUIDE

G732 - Advanced Process Control

Degree in Industrial Technologies Engineering

Academic year 2023-2024

1. IDENTIFYING DATA

Degree	Degree in Industrial Technologies Engineering		Type and Year	Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications			
Discipline	Subject Area: Electronics and Automation Optional Module			
Course unit title and code	G732 - Advanced Process Control			
Number of ECTS credits allocated	6	Term	Semester based (2)	
Web				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. TECNOLOGIA ELECTRONICA E INGENIERIA DE SISTEMAS Y AUTOMATICA
Name of lecturer	MARIA SANDRA ROBLA GOMEZ
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Other lecturers	

3.1 LEARNING OUTCOMES

- Ability to analyze and design control systems using advanced techniques

4. OBJECTIVES

Describe the internal representation systems using state variables.
Present the possibilities for the control of multivariable systems by state feedback.
Introduction to optimal control systems.
Study the techniques of nonlinear control systems.

6. COURSE ORGANIZATION

CONTENTS	
1	CONTROL BY STATE VARIABLES Description of physical systems using state variables. Internal representation of systems. Analysis of control systems with state variables. State transition matrix. Controllability and observability. State feedback. Observer states.
2	OPTIMIZATION OF CONTROL SYSTEMS Parameters of behavior control systems Optimization of continuous and discrete regulators. Optimal linear quadratic regulator.
3	NONLINEAR CONTROL SYSTEMS Description of nonlinear system by descriptive function. Descriptive function of the most common nonlinearities. Stability of nonlinear systems. Control of nonlinear systems

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Evaluation of laboratory practices	Laboratory evaluation	No	Yes	20,00
Final exam	Written exam	No	Yes	30,00
Realization of a control during the course	Written exam	Yes	Yes	30,00
Final exam laboratory practices	Laboratory evaluation	Yes	Yes	20,00
TOTAL				100,00
Observations				
Attendance at practices is mandatory for all students				
Observations for part-time students				
For part-time students, a final exam will be held with one part of theory and one part of practices, with a weight of 50% each.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

José Gómez Campomanes. "Automática: Análisis y Diseño de los Sistemas Automáticos de Control". Ediciones Jucar
J. Pérez Oria. "Sistemas Continuos de Control". Ediciones TDG.
Athans M. and P. Falb. "Optimal Control: An introduction to Theory and its Applications". Mc Graw-Hill.
Callier F. and C. Desoer. "Multivariable Feedback Systems". Springer-Verlag
Khlil H. "Non Linear Systems". Ed. Macmillan.