



Universitat de Lleida

DEGREE CURRICULUM
**CONTROL AND ROBOTICS
SYSTEMS DESIGN**

Coordination: Jordi Palacín

Academic year 2014-15

Subject's general information

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| Subject name | Control and Robotics Systems Design |
| Code | 102127 |
| Semester | 2n Q Avaluació Continuada |
| Typology | Obligatòria |
| ECTS credits | 6 |
| Theoretical credits | 0 |
| Practical credits | 0 |
| Coordination | Jordi Palacín |
| Office and hour of attention | Consultar |
| Department | Informàtica i Enginyeria Industrial |
| Modality | Presencial |
| Important information on data processing | Consult this link for more information. |
| Language | Català |
| Degree | Degree in Automation and Industrial Electronic Engineering |
| Distribution of credits | Lectures: 3 Credits Practical work: 3 Credits |
| Office and hour of attention | Consultar |
| E-mail addresses | palacin@diei.udl.cat |

Jordi Palacin

Subject's extra information

Recommended basic subjects: "Senyals i Sistemes" and "Teoria Bàsica del Control"

Learning objectives

see competences

Competences

Degree-specific competences

- Knowledge of automatic regulation and control techniques and their application to industrial automation.
- Ability to design control and industrial automation systems.
- Knowledge of the basis and applications of robotic systems.

Goals

- Understanding the operation of robots and the design of robotic applications.
- Understanding the basic rules of diverse control systems.
- Understanding the goals of a control system in a robotized system.
- Ability to design analogical, digital and high-power electronic systems.
- Knowledge and ability to make models and simulate systems.

Degree-transversal competences

- Ability to resolve problems and elaborate and defend arguments inside their field of study.
- Ability to gather and interpret relevant data in their field of study, and to emit judgements that include a reflection on relevant themes of a social, scientific or ethical nature.

Subject contents

Without translate-

Bloc: T.1. Control aplicat

T.1.1. Aplicació pràctica de sistemes de control

T.1.2. Control PID aplicat

T.1.3. Control mitjançant senyal PWM

T.1.4. Funcionament de motors pas a pas i de corrent continu

T.1.5. Sistemes electrònics de control de motors

T.1.6. Exemples de control aplicat

Bloc: T.2. Control de robots

T.2.1. Model cinemàtic directe

T.2.2. Metodologia de Denavit y Hartenberg

T.2.3. Model cinemàtic invers

Bloc: T.3. Aplicacions

T.3.1. Programació de robots en la indústria

T.3.2. Control realimentat de robots mitjançant visió artificial

Development plan

The development of the subject will be based on the practical work performed at different laboratories of the university.

The contents and description of the practical work will be available at the web.

The development of the practical work will be based on the Matlab programming environment.

Evaluation

The evaluation is based on the weighted practical work performed during the course.

$$NC = (NP1 \cdot P1 + NP2 \cdot P2 + NP3 \cdot P3 + NP4 \cdot P4 + NP5 \cdot P5 + NP6 \cdot P6)$$

If **NC** is lower than 5.0 there will be an optional exam with a weight of 8 points, the final mark will be computed with:

$$NF = NR + (NC \times 0,2)$$

Bibliography

Recommended bibliography

Apunts de l'assignatura.

"Introduction to Robotics", Philip J. McKerrow, Addison-Wesley, ISBN 0-534- 914370-5.

"Robótica: Control, Detección, Visión e Inteligencia", K.S. Fu, R.C. González, C.S.G. Lee. McGraw-Hill, ISBN 84-7615-214-0

"Control Robótico", P. M. Taylor, Eds. Ceac, ISBN 0-333043821-3