

Course Unit Description - (ROBIN)

(Industrial Robotics)

(Mestrado em Engenharia Electrotécnica e de Computadores)

Academic year: 2009/2010



Subject group: Automação e Robótica

	Semestral	Optional		
Mode of study	Diurno	Hours/Week	T-Teórica	2
Year	1 ^o		PL-Prática-Laboratorial	2
Semester	1 ^o		OT-Orientação Tutorial	1
ECTS				6

Objectives

This course presents as its main objectives to teach the principles of robotic manipulation and its main application fields. The aspects of mathematical foundation of robotics are placed in a second plane, being referred just in an introductory phase of the course.

In this way, it is intended to make the students aware of the terminology used in robotics and create in them a knowledge base that allows them to identify which applications may be subject of robotization, bearing in mind, always, the advantages and limitations of robot utilization. It is still the objective of this course to supply tools for the development of robotic applications and focus on the main aspects of safety norms to be followed in the development of these applications.

It should be mentioned that, although it is not studied a particular robot programming language, it is expected that at the end of this course students (that already have programming knowledge) will be able to easily learn and understand any programming language to program robot arms.

Course Contents

1. Introduction to Robotics
2. Basic Notions of Robotics
3. Sensors for Industrial Robots
4. Grippers and Tools for Industrial Robots
5. Robot Programming Methods and their Evolution
6. Safety During Robot Programming and Operation
7. Industrial Applications of Robotics
8. Methodologies for the Implementation of Robotic Applications
9. New Robotic Application Areas

Recommended reading

1. Industrial Robotics: Technology, Programming and Applications; M. P. Grover, et al.; McGraw-Hill; 1986.
2. Handbook of Industrial Robotics; Shimon Y. Nof (Editor); John Wiley & Sons, Inc.; 1999.
3. Introduction to Robotics; Phillip John McKerrow; Addison Wesley; 1991.
4. Introduction to Robotics – Mechanics and Control; John J. Craig; Addison Wesley; 1989.
5. Robo Sapiens; Peter Menzel and Faith D'Aluisio; The MIT Press; 2000

Teaching Methods

Theoretical classes:

- Presentation of the theoretical subjects by the teacher;
- Presentation of small commercial videos of robotic technologies and applications;
- Power Point slides used in the classes will be given to the students.

Tutorial classes:

- Support to a research work developed by groups of four students.

Laboratory classes:

- Learning (in an autonomous way) the work principle of a robotic simulation and off-line programming software for industrial robots (Robot Studio 5.12, ABB Robotics);
- Development of a robotic cell project and simulation;
- Development of ABB robots programs.

Assessment methods

Assessment during the classes

Continuous assessment during the classes. With this purpose the teacher will evaluate the research work developed by the students, that will be presented in the classes, and also the work developed in the laboratories.

Techniques, instruments and assessment criteria – Exam assessment

There will be no exam.

Final course classification

Final course classification = x.TRAB+ y.LAB

x = 0.50;

y = 0.50;

Minimal grade of 7 values in each component.

Grade improvement (Assessment)

The students will have to improve the research work develop during the semester and/or the laboratories work.

Name

Teacher responsible:	Manuel Fernando dos Santos Silva (MSS)
Lecturer:	Manuel Fernando dos Santos Silva (MSS)