

FACULTY OF **ENGINEERING**

DEGREE COURSE: **INDUSTRIAL ENGINEERING**

MASTER DEGREE: **INDUSTRIAL ENGINEERING / DESIGN**

SUBJECT: MECHANICS OF AUTOMATED MACHINES

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OBJECTIVES

The first part of the course provides the theoretical basis for the kinematic and dynamic analysis of machines for motions in the space. The second part deals with the description of mechanical and electric components of automated machines, emphasizing the case of industrial robotics. Finally, basic issues on motion planning and control will be introduced.

CONTENTS

Kinematics and dynamics for motions in the space - Denavit-Hartenberg method - Jacobian analysis and singularities - Kineto-static duality - Mechanical components of automated machines - Electrical motors and drives - Sensors - Industrial robots - Motion planning and control.

LEARNING OUTCOMES

The course provides the knowledge of machine mechanics and automation necessary to approach the study and design of automated machines and robots.

ASSESSMENT

Written exam: multiple choice and open questions

RECOMMENDED TEXTBOOKS

- John J. Craig, Introduction to Robotics
- Ahmed A. Shabana, Dynamics of multibody systems