

## Materia 4\_41: Introduction to Robotics

<b>Materia:</b>	Robotics	ECTS:	20
<b>Descriptores</b>	<ul style="list-style-type: none"> <li>Industrial manipulator robots, morphology and configuration. Angular robot. SCARA, Cartesian, Delta. Station design alternatives. Layout. External axes, transport elements, feeding and piece positioning</li> <li>Methods, techniques for programming industrial manipulator robots. Definition of movement. Guided programming. Textual programming. Direct, indirect, and hybrid programming. Methodologies for programming typical applications: pick &amp; place.</li> <li>Control of robotic systems. Direct and inverse kinematic control of robots. Kinematic position problem. Robot dynamic equation. Dynamic control of robotic systems.</li> <li>Kinematic model. Robot localisation. Control of mobile robots.</li> </ul>		
<b>Objetivos generales</b>	This subject has the objective of studying the principles of industrial manipulator robots.		
<b>Competencia específica</b>	CE [4-41]: Apply techniques to estimate the location and control the navigation of mobile robots and apply kinematic and dynamic problem-solving techniques for robot control		
<b>Resultados de aprendizaje</b>	<ul style="list-style-type: none"> <li>Understanding the functional structure of robots, their components, morphology, and classification based on their configuration and use in industrial and service applications</li> <li>Analysing and evaluating the automation of a workstation and the elements involved in robotics stations for use in industrial processes.</li> <li>Knowing the different methods of programming robots and the most significant parameters for defining the movements of robots.</li> <li>Applying dynamic adaptation to variations in the environment through programming collaborative robots (cobots) based on sensors.</li> <li>Applying kinematic and dynamic problem-solving techniques for the control of robots.</li> <li>Knowing the kinematic modelling principle of mobile robots to program solutions to the problem of their control</li> <li>Applying techniques to estimate the location and control the navigation of mobile robots.</li> </ul>		
<b>Métodos de evaluación</b>	<ul style="list-style-type: none"> <li>Evaluation: Written open-ended test and Problems</li> <li>Assessment instruments: Checklists and Rating Scales</li> </ul>		