

320193 - RA - Applied Robotics

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
 Teaching unit: 707 - ESAIL - Department of Automatic Control
 Academic year: 2019
 Degree: BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Optional)
 ECTS credits: 6 Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: Rita Maria Planas Dangla
 Others: Juan Carlos Hernandez

Learning objectives of the subject

Study load

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours small group:	30h	20.00%
	Self study:	90h	60.00%

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Content

<p>Robotics: basic concepts</p>	<p>Learning time: 14h Theory classes: 6h Self study : 8h</p>
<p>Description:</p> <ol style="list-style-type: none"> 1- History of the robotics 2- Fields of applications 3- Industrial Robotics 4- Manipulators and Robots: basic concepts. 5- Types of Robots: <ol style="list-style-type: none"> 5.1 Industrial Robots: Fundamental features. 5.2 Mobile Robots: Fundamental features. 5.3 Medic Robots: Fundamental features. 5.4 Zoomorphic Robots: Fundamental features. 5.5 Android Robots: Fundamental features. 5.6 Teleoperated Robots: Fundamental features. 6- Sensors and actuators for the robotics 	
<p>Relevant parameters for robot design</p>	<p>Learning time: 34h Theory classes: 4h Laboratory classes: 8h Self study : 22h</p>
<p>Description:</p> <ul style="list-style-type: none"> - Static Parameters - Dynamic Parameters - Study of the required functionalities - Tasks to do 	
<p>Relevant parameters for end effectors design</p>	<p>Learning time: 34h Theory classes: 4h Laboratory classes: 8h Self study : 22h</p>
<p>Description:</p> <p>End effectors: Fundamental features. Adapting End Effectors to the robotized tasks. Specific design of End effectors.</p>	

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<p>Robot Programming</p>	<p>Learning time: 46h Theory classes: 8h Laboratory classes: 14h Self study : 24h</p>
<p>Description: Introduction to Robot programming TRAPs and Time Control Input-Output signal Management in order to integrate Robots in production lines Multitasking Robot Programming. Operator interface design</p>	
<p>Robot-Environment connection</p>	<p>Learning time: 12h Theory classes: 4h Self study : 8h</p>
<p>Description: Robotized tasks: Adapting the environment to the robot. Design of the environment Adapting the robot to the environment: sensory control.</p>	
<p>Robot Safety components design</p>	<p>Learning time: 10h Theory classes: 4h Self study : 6h</p>
<p>Description: Robot safety components. Robotized task safety components Safety regulations inside the robotic field</p>	

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Bibliography

Basic:

Fu, K.S.; González, R.C.; Lee, C.S.G. Robótica: control, detección, visión e inteligencia. Madrid: McGraw-Hill, 1988. ISBN 8476152140.

Angulo Usategui, J.M.; Romero Yesa, S.; Angulo Martínez, I. Introducción a la robótica: principios teóricos, construcción y programación de un robot educativo. Madrid: Thomson, cop. 2005. ISBN 8497323866.

Torres, Fernando [et al.]. Robots y sistemas sensoriales. Madrid: Prentice Hall, cop. 2002. ISBN 8420535745.

Complementary:

McKerrow, P.J. Introduction to robotics. Sidney, [etc.]: Addison-Wesley Publishing Company, 1991. ISBN 0201182408.

Craig, John J. Introduction to robotics: mechanics and control. 2nd ed. Reading, MA [etc.]: Addison-Wesley, 1989. ISBN 0201095289.

Others resources:

Computer material

RobotStudio

Robot Simulator Software