

Mechanical design methods in robotics			
Credits: 5 Semester 2 Compulsory: No			
Format	Lectures 25 h	Supervised project 15 h	Private study 85 h
Lecturers: K.Mianowski (WUT), S. Caro (ECN), D. Chablat (ECN), D. Zlatanov, M. Zoppi (UNIGE), C. Vila (UJI)			
<p>Objectives: This course presents the overview of the design process – specification, conceptual design, product design. The students will learn basic principles of industrial robot design.</p> <p>Contents: The following subjects will be discussed:</p> <ul style="list-style-type: none"> - Conceptual design: concept generation, concept evaluation. - Product design: documentation, product generation, evaluation for function and performance, evaluation for cost, ease of assembly and other measures. - Computer aids for mechanical design. CAD/CAE/CAM systems. - The design of robotic production cell. - Fundamentals of integrated design of control and drive systems taking into account measurement, gearing and transmission systems. - Design of a serial robot manipulator (using CAD). <p>Practical Work: CAD design of manipulator.</p>			
<p>Abilities: After completing this course, the students will be able to:</p> <ul style="list-style-type: none"> - Design a serial robotic manipulator. - Formulate properly the needed information for conceptual design (requirements), - Use CAD systems on the basic level for the design of typical mechanism (serial arm), - Elaborate the design on general level without material, drive systems and actuators consideration, - Provide the conceptual documentation for the arm design. 			
Assessment: 30% continuous assessment, 70% from end of semester examination.			
<p>Recommended texts:</p> <ul style="list-style-type: none"> - K.C.Gupta, <i>Mechanics and Control of Robots</i>, Springer 1997 - J.E.Shigley, J.J.Uicker, <i>Theory of Machines and Mechanisms</i>, McGraw Hill 1995. <p>Further readings: CAD software documentation</p>			