

Programme of “Sistemi di Produzione Automatizzati” - “Automated Manufacturing Systems”		
<ul style="list-style-type: none"> • Code: I2G006 • Type of course unit: compulsory • Level of course unit: second cycle • Year of study: second, semester: second 		
Number of ECTS credits: 9 (workload of 90 hours of teaching + work at home; 1 credit = 25 hours of total activities)		
Teacher: Prof. Mario Palumbo		
1	Course objectives	The aim of the course is to introduce the student in the world of automated manufacturing. On successful completion of this module, the students should receive the instruments for designing, planning and managing an automated manufacturing system, i.e. a production system in which all phases of manufacturing (components prefabrication, product assembly, material handling and storage) are carried out by means of computerized devices, pieces of equipment and systems.
2	Course content and Learning outcomes (Dublin descriptors)	<p>Topics of the module include:</p> <p>Fundamentals of Industrial automation. Computer Aided Design and Manufacturing. Computer Integrated Manufacturing. CNC machines. Transfer Lines. Flexible Manufacturing Systems. Automatic transport systems. Sensors and transducers. Fundamentals of pneumatic and hydraulic power systems. Programmable Logic Controllers. Industrial robots. Assembly Automation. Design for Assembly. Automatic Storage and Retrieval Systems.</p> <p>On successful completion of this module, the student will:</p> <ul style="list-style-type: none"> - have knowledge of devices used in the automation of systems; - have knowledge and understanding of the procedures to: <ul style="list-style-type: none"> o size automatic manufacturing systems; o design basic pneumatic-oleodynamic actuation system; o program the main devices used in industrial automation (CNC machines, PLC...). - be able to select: <ul style="list-style-type: none"> o the best architecture of manufacturing system in a given scenario of production volume - production mix; o the best control system and the correct sensors and actuators in a given automation application;
3	Prerequisites and learning activities	Prerequisites: mathematics; physics; basics of manufacturing processes.
4	Teaching methods and language	<p>Lectures and exercises. Language: Italian</p> <p>Ref. Text books:</p> <ul style="list-style-type: none"> • L.Horath - Computer Numerical Control Programming of Machines - Macmillian New York • ISO 6983-1:2009 - Automation systems and integration -- Numerical control of machines - - Program format and definitions of address words -- Part 1: Data format for positioning, line motion and contouring control systems • M.P.Groover - Automatic Production Systems and Computer Integrated Manufacturing - Prentice-Hall International • Y.Koren - Robotics for Engineers - McGraw Hill • Standard IEC 61131-3:2013 - Programmable controllers - Part 3: Programming languages • B.Lotter - Manufacturing Assembly Handbook – Butterworth Heinemann • G.Boothroyd, C.Poli, L.E.Murch - Automatic assembly - M.Dekker • G.Boothroyd, P.Dewhurst, W.A.Knight - Product Design for Manufacture and Assembly - CRC Press <p>Some didactic materials and scientific papers published by the teacher</p>
5	Assessment methods and criteria	Oral examination, Discussion of technical reports prepared by students before the final examination