Programme of **Gestione dei processi tecnologici** "Manufacturing processes automation, manufacturing cycles optimization, product design for manufacturing"		
• Code: **I2G044** • type of course unit (compulsory, optional): **compulsory for the master degree course in management engineering** • level of course unit (e.g. first, second or third cycle; sub-level if applicable): **second cycle** • year of study (if applicable):, semester: **1rd year, 2st semester**		
Number of ECTS credits: **6** (workload is **150** hours; **1 credit = 25 hours**)		
Teacher: **Antoniomaria Di Ilio**		
1	**Course objectives**	The goal of this course is to provide the motivations, definitions and techniques for the analysis of problems concerning process automation and the product development by taking into account the technological knowledge acquired during the first level course as well as manufacturing costs and management aspects. On successful completion of this module, the student should understand the fundamental concepts necessary to the design of manufacturing cycles as well as industrial products optimized for the manufacturing process
2	**Course content and Learning outcomes (Dublin descriptors)**	Topics of the module include: **Industrial automation**: structure and components of numerical control machines, fundamentals of CNC programming. **Design and optimization of manufacturing cycles**: choice of the raw workpiece, tools, definition of the operation sequence choice and optimization of the machining parameters. **Rapid manufacturing**: principles and use various rapid manufacturing techniques to optimize the product design and shorten the time to market. **Design for manufacturing and Assembly**: principles of DFM&A to develop products which are easy to manufacture and assembly in order to reduce costs while assuring their functionality. **Computer Aided Process Planning**: automation of the design of the manufacturing cycle, Computer Aided Process Planning (CAPP). On successful completion of this module, the student should - have profound **knowledge** of the basic techniques necessary to design manufacturing cycles and product designed for manufacturing; - have **knowledge and understanding** of process automation concepts and computer aided process planning; - **understand and explain** correlation between manufacturing requirements, product functionality and production costs; - **understand** how time and production costs depend on the initial concept of the product as well as the required functionality; - **demonstrate skill** in design and optimization of manufacturing cycles, choice of machines tools and equipment and **ability** to conceive principles of DFM&A and CAPP. - demonstrate **capacity** for reading and understand other texts on related topics.
3	**Prerequisites and learning activities**	The student must know the basic notions of Materials Science and Technology and Manufacturing Processes.
4	**Teaching methods and language**	Lectures and exercises. **Language:** Italian The students are required to develop individually or in team a homework concerning the study of a manufacturing cycle taken from an industrial case or assigned by the teacher during the course. **Ref. Text books** Slides used in class and made available through the network; Giusti-Santochi: "Tecnologia meccanica e studi di fabbricazione", (part dealing with the automation and NC programming). Other texts only for consultation: Iuliano-Gatto: Introduzione alle tecniche di prototipazione rapida e attrezzaggio rapido; Serope Kalpakjian: Manufacturing Engineering & Technology; Boothroyd et al.: Design for Manufacture & Assembly.
5	**Assessment methods and criteria**	Discussion of the work developed during the course and oral exam