Programme of "**Manufacturing technology**"

"Technological properties of metals, Foundry technology, Plastic working of metals, Machining with machine tools, Welding"

• Code: **I0638**
• type of course unit (compulsory, optional): **compulsory for management and mechanical courses of the bachelor degree course in industrial engineering**
• level of course unit (e.g. first, second or third cycle; sub-level if applicable): **first cycle**
• year of study (if applicable):, semester: **3rd year, 1st semester**

Number of ECTS credits: **9** (workload is **225** 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 traditional manufacturing process of metals, from the raw material to the finished product. On successful completion of this module, the student should understand the fundamental principles of the various techniques on which the manufacturing technologies are based.
2	**Course content and Learning outcomes (Dublin descriptors)**	Topics of the module include: **Material characterization**: main mechanical and technological test to characterize metals aimed at the choice of process parameters. **Foundry technology**: principles and techniques for the manufacturing of raw products by melting and solidification of metals. **Metalworking process**: principles and techniques to obtain products utilizing the property of metals to be plastically deformed under appropriate stresses. **Machining with machine tools**: principles and main machining processes (lathe turning, milling, drilling, broaching, reaming, grinding) to bring a raw workpiece into its final shape with the required tolerances. **Welding**: classification and main techniques to permanently joint metal parts by means welding. On successful completion of this module, the student should: - have profound **knowledge** of the basic principles of manufacturing technologies for the manufacture of metal parts; - have **knowledge and understanding** about the influence of the material properties in the selection of process parameters; - **understand and explain** how the process influence the final properties of the product; - **understand** the differences and correlations between various manufacturing processes; - **demonstrate skill** in the choice of the main parameters for each manufacturing technology faced during the course and the **ability** to recognise the main cause of defects generated during the process. - demonstrate **capacity** for reading and understand other texts on related topics.
3	**Prerequisites and learning activities**	The student must know the basic notions of General Chemical and Materials Science and Technology.
4	**Teaching methods and language**	**Lectures and exercise. Language:** Italian **Ref. Text books** Slides projected in class and made available through the network (for the access, send an e-mail to antoniomaria.diilio@univaq.it) Other texts for consultation (available in Library): 1) Giusti-Santochi: Tecnologia meccanica e studi di fabbricazione, Ed. Pitagora, Bo; 2) Giardini C., Bugini A., Pacagnella: Tecnologia meccanica, Vol. I - Lavorazione per fusione e deformazione plastica, Vol. II - Lavorazione per asportazione di truciolo, Ed. Città Studi, Milano; 3) F. Gabrielli, R. Ippolito, F. Micari: Analisi e tecnologia delle lavorazioni meccaniche - McGraw-Hill. 4) Serope Kalpakjian, Steven R. Schmid: Manufacturing Engineering & Technology, Pearson Education - Prentice Hall
5	**Assessment methods and criteria**	**Oral exam**