

Faculty	Ingegneria
Bachelor	Mechanical Engineering (La Spezia)
Year/Semester	2/I

Course Title	Manufacturing Technology
ID Course Code	60463
Course Credits (CFU)	6
Scientific-Disciplinary Sector	ING-IND/16
Course Type	Mono-disciplinary course
Lecturer-in-charge	LONARDO Pietro

Learning Outcomes:

The course aims at providing the basic principles necessary to deal with the issues of mechanical production. After an introduction on the mechanical metrology, the cutting theories applied to the manufacturing processes are discussed and the fundamentals of machine tools are presented. Welding processes are also studied.

Course Organisation Details

Introductory concepts on mechanical production. Mechanical metrology: quantities, uncertainty of measurement, indirect measurements, statistical analysis for repeated measures, measurements and instruments, interferometry, CMM; surface micro-geometry, parameters and measurement instruments, 3-D analysis, surface nano-geometry, AFM. Metal cutting: tool geometry and chip formation, mechanics of orthogonal cutting, shear plane criteria, cutting forces and dynamometers, thermodynamics of cutting and temperature measurements; tool materials, wear mechanisms, tool life and predictive models. Machine tools: kinematics and form generation, structural elements, slideways, spindles, mechanisms and motors, transducers; analogue and digital control (NC). Welding processes: classification, joints types, parameters, arc welding processes, thermal cycles, metallurgy, heat-affected zone, defects; resistance welding, brazing and soldering.

Assessment	hours
Lectures	50
Practice	10
Laboratory	
Integrative activities	

References

P.M. Lonardo, *Lezioni di Tecnologia Meccanica*, 2009;
A. Zompì, R. Levi, *Tecnologia Meccanica*, UTET, 2001;
M. Santochi, F. Giusti, *Tecnologia meccanica*, Casa Editrice Ambrosiana, 2004;
A.J. Lissamann, S.J. Martin, *Principles of Engineering Production*, Hodder and Stoughton, 1982.

Organization and examinations

The course is based on lectures and numerical exercises.

Pre-requisites

Basic knowledge of mathematical analysis, physics and mechanics of materials.