Università degli Studi della Basilicata
Scuola di Ingegneria

COURSE: Manufacturing Technology				
TEACHER: dr. Paolo Renna				
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Language italian				
ECTS: 9	n. of hours: 90	Academic year: 2014/2015	Campus: Poetnza	Semester: I°

TOPICS

Mechanical property of the materials. Tensile test, Hardness tests and main technological tests. Surface, dimensions, tolerances and related attributes. Material removal processes: theory of metal machining, cutting tool technology, Turning, drilling, milling, grinding, and other machining operations. Economic considerations in machining. Overview of metal forming, material behavior in metal forming. Bulk deformation: forging, rolling, drawing and extrusion. Sheet metalworking: cutting, bending and other processes. Fundamentals of welding: arc welding, resistance welding, oxy-fuel gas welding and other fusion welding processes. Assurance quality management.

TEACHING METHODS (please tick one or more options)

□ **Theoretical lessons**
□ **Tutorials in classroom**
□ Tutorials in laboratory
□ Project works
□ Technical visits
Other activities (please specify) Seminar _____

TEXTBOOKS

F. Giusti e M. Santochi, Tecnologia Meccanica e Studi di Fabbricazione, Casa Editrice Ambrosiana, Milano;
Serope Kalpakjian, Steven R. Schmid, "Tecnologia Meccanica", 5° edizione, Pearson PRentice hall;
On line lectures materials on: https://sites.google.com/site/paolorenna/home/didattica/tecnologia-Meccanica-9CFU

ON-LINE EDUCATIONAL MATERIAL

web address: https://sites.google.com/site/paolorenna/home/didattica/tecnologia-Meccanica-9CFU

LEARNING OUTCOMES

Understand the fundamentals of manufacturing and manufacturing processes in mechanical industries; Understand manufacturing processes such as Forming, Cutting, and Welding; Understand the main mechanical removal processes (turning, milling, drilling and grinding) and the main bulk and metal sheet deformation processes. Understand the product design and economic considerations of the semi-raw and final product. Understand the process plan of the manufacturing operations and design the main parameters of the manufacturing processes. Understand the main issues of the assurance management systems.

REQUIREMENTS

EVALUATION METHODS (please tick one or more options)

□ Intermediate verifications
□ **Written examination**
□ Discussion of a project work
□ Practical test
□ **Oral examination**
Other methods (please specify) _____

DETAILED CONTENT

SECTION I. Material properties and product attributes
1.1. Effect of alloys element in steels
1.2. Production of raw steel materials
1.3. Thermal treatment
1.4 Mechanical materials properties tests

1.5 Steels classification

SECTION II. Material Removal Processes
2.1 Overview of machining technology
2.1 Dimensional tolerance
2.2 Surface technology
2.3 Machining operations: Turning, Drilling, milling, grinding.
2.4. Cutting tool technology: tool geometry, tool materials.
2.5 Cutting parameters
2.6 Tool life
2.7 Economic considerations in machining
2.8 Non traditional machining processes
2.9 Cutting fluid
2.9 Machining and turning centers

SECTION III. Metal Forming and Sheet metalworking
3.1 Overview
3.2 Material behavior in metal forming
3.3. Compression test
3.4 Plasticity criterions
3.3 Stress/deformation relations
3.4 Design of a metal forming process
3.5 Forging
3.6 Rolling
3.7 Drawing
3.8 Extrusion
3.9 Metal sheet working: Cutting, Bending and Drawing

SECTION IV. Welding
4.1 Overview
4.2 Arc welding
4.3 MIG – MAG welding
4.4 Resistance Welding

SECTION V. Assurance quality management
5.1. Overview of assurance quality management systems
5.2 Quality control responsibility
5.3 Design process
5.4 Supply processes
5.5 Project revisions
5.6 Customer satisfaction

SEMINARS BY EXTERNAL EXPERTS **YES** □ NO □

FURTHER INFORMATION