

Course unit title:	Manufacturing Processes		
Course unit code:	ME201		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	2		
Semester when the unit is delivered:	3 (Fall)		
Number of ECTS credits allocated :	5		
Name of lecturer(s):	Dr. Sotiris Omirou (lecturer & unit leader)		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Describe the various manufacturing processes that are used for the production of mechanical parts and products. 2. Classify manufacturing processes according to the needs of products construction. 3. Employ the theoretical knowledge of various manufacturing processes when a specific product has to be manufactured. 4. Compare and contrast the advantages and limitations of different manufacturing processes. 5. Evaluate the better way of manufacturing and construction of mechanical parts or products by means of various manufacturing processes and the corresponding manufacturing machines. 6. Design the production of a mechanical component or a specific product using the manufacturing processes of casting, bulk deformation, sheet-metal forming, material-removal and Joining. 7. Explain the impact and importance of adopting integrated manufacturing systems in modern manufacturing. 		
Mode of delivery:	Face-to-face		
Prerequisites:	ME110	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	<ul style="list-style-type: none"> • Introduction to manufacturing processes: Definition of manufacturing, purpose of manufacturing, classification of the various types of manufacturing processes, selecting materials and manufacturing process, manufacturing industries, resources for manufacturing. • Casting processes: Solidification of metals, cast structures, casting metals and alloys, technology and machines of casting processes, sand casting, shell mold casting, expendable mold casting, investment casting, permanent mold casting, hot and cold die casting, centrifugal casting, vacuum casting, solidification time, casting defects. • Forming processes: Technology of forging, rolling, cold and hot extrusion, rod, wire and tube drawing, required properties of materials, sheet-metal forming processes, sheet-metal characteristics, shearing, bending of sheet and plate, stretch forming, deep-drawing, formability of sheet metals • Material-removal processes: Technology and machines for milling, turning, shaping, drilling, broaching, mechanics of chip formation, tool wear, surface finish and integrity, cutting-tool materials, cutting fluids. • Joining processes: Oxyfuel gas welding, thermit welding, arc-welding, consumable and nonconsumable electrode, resistance welding, solid-state welding, electron-beam welding, Laser beam welding. • Introduction to Integrated Manufacturing Systems: Manufacturing systems, Computer Integrated Manufacturing, Computer Aided Design, group technology, cellular manufacturing, flexible manufacturing systems 		
Recommended and/or required			

reading:	
Textbooks:	Mikell P. Groover, <i>Fundamentals of Modern Manufacturing: Materials, Processes, and Systems</i> , John Wiley & Sons, 5 th edition, 2013.
References:	Serope Kalpakjian, Steven R. Schmid, <i>Manufacturing Processes for Engineering Materials</i> , Prentice Hall, 2007.
Planned learning activities and teaching methods:	The course material is mostly delivered to the students by means of lectures, conducted with the help of computer presentations, although demonstration of some manufacturing methods and site visits are performed. Lecture notes and presentations are available through the web for students to use in combination with the textbooks.
Assessment methods and criteria:	<ul style="list-style-type: none"> • Tests: 40% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No