

IE 252: Manufacturing processes -1-**3 (3,1,1)**

Catalog Data	Understanding engineering materials and processing parameters that influence design considerations, product quality, and production costs; stress, strain analysis and mechanical properties of materials applied to metal forming processes; sheet metal forming, deep drawing, stretch forming and bending; drawing, forging, rolling and extrusion processes; basic casting techniques; Welding processes.
Prerequisite	IE251, Engineering drawing
Co requisite	
Level	5
Textbook	* <i>Manufacturing Processes for Engineering Materials</i> , 5th Ed., S. Kalpakjian and S. Schmid, Upper Saddle River, NJ: Prentice Hill (2008).
Reference	* Manufacturing Engineering Processes, L. Alting, Marcel-Dekker. * Fundamentals of Modern Manufacturing: Materials, Processes, and Systems, Mickell P. Groover. * Manufacturing Engineering Processes أختيار العمليات الهندسية للتصنيع By Prof Ali M Alsamhan and Prof Saied Darwish, Research center college of engineering, Project 50/426, June 2006

Learning outcomes Objectives	To introduce, design, analyze and discuss the various manufacturing processes that are available and relate to their characteristics, cost and volume needs, and design requirements. [b, c, e]. 1. Understand basic product design and manufacturability. [b,c,e] 2. Describe bulk metal forming operations and calculate the associated force and energy requirements. [c,e] 3. Describe sheet metal forming operations and calculate the associated force and energy requirements. [c,e] 4. Describe molding and casting processes and perform metal casting molds design.[c] 5. Charge calculation in melting furnaces.[b,c] 6. Describe welding parameters, effects and quality control of welding joints.[b,c,e]
-------------------------------------	---

Topics (classes)	Topic	Weeks	Contact Hr
	1. Morphology of manufacturing process.	1	3
	2. Fundamental theory of metal forming.	2	6
	3. Bulk metal forming processes.	3	9
	4. Metal welding processes	3	9
	5. Metal casting processes	3	9
	6. Sheet metal forming processes	3	9
Lab. work	1 Experiment of compression test	2	1 Lab
	2 Plastisine direct extrusion experiment	2	1 Lab
	3 Sheet metalworking experiment	2	1 Lab
	4 Welding processes	2	2 Lab
	5 Sand casting and sand testing experiments	2	2 Lab

- Estimated Category Content Engineering (Science: 2 credit hours (50%) Engineering Design: 2 credit hour (50%))
- Prepared by Dr Ali M Alsamhan Room 2A112
- Preparation Date Instructor Dec 2009 – Updated Sep 2016,
Prof. Dr Ali M Al Samhan, Room 2A112, <http://fac.ksu.edu.sa/asamhan>