Engineering Program

Specialization Production and Computer Aided Manufacturing Technology
Course Number ٠٢٠٢٠٢٢٣٢
Course Title **Forming Technology Workshop**
Credit Hours (1)
Theoretical Hours (0)
Practical Hours (3)

Brief Course Description:

Practicing forming processes (hot and cold working processes) and analyzing structure and properties of metals and alloys, providing casting process and mold preparation ; sand mold, metallic, …), cold rolling, pressing, bending, drawing, and shearing process.

Course Objectives:

At the end of this course student will be able to:

1. Practice the basic forming processes to understand them to select the proper technique to manufacture a certain product
2. Control the performance of the specified forming process and product quality as a result of the concepts and hypotheses that gained after performing sets of experiments and studies regarding the variables and factors affecting each of the forming processes
3. Practice the most important and various forming processes of plastics specially processes important in industry

Detailed Course Description:

Number	Title	Content	Time
	Metal casting	Sand casting/Pattern design and manufacturing	
		Sand casting/Procedures	
		Permanent mold casting	
	Metal extrusion	Equipment and tools Material selection Extrusion parameters (force and speed) Process evaluation	
	Deep drawing of metals	Equipment and tools Preparation of raw material Drawing punches and dies Forces and speed of drawing Lubrication Factors affecting the product quality	
	Polymers injection	Equipment and tools Material selection Injection mold Process parameters (temperature and pressure)	
	Sheet metal working	Principles and basics of shearing Rolling processes Shearing processes Bending processes Deep drawing	
	Piercing and blanking	Shearing processes Shearing punches and dies selection Shearing forces Equipment and tools Operating factors	

	Polymer compact molding/ die pressing	Equipment and tools Material selection Process parameters	
	Thermoforming of polymers	Equipment and tools Preparation of plastic sheets Process parameters Product quality	
	Extrusion of plastics	Extrusion machine (extruder) Heating of plastics Processes variables Process evaluation	
	Polymer blow molding	Equipment and tools Process variables Product quality	

Evaluation Strategies:

Evaluation		**Percentage**	**Date**
Exams	Midterm	20%	
	Final Exam	50%	
Projects and Assignments and reports		30%	

Teaching Methodology:

- Lecturing
- Technical videos watching
- Workshop practicing

Text Books & References:

Text Books:

- تقنية التشكيل (عملي)، الإدارة العامة لتصميم وتطوير المناهج، المؤسسة العامة للتعليم الفني والتدريب المهني، المملكة العربية السعودية

References:

- Provided workshop manual
- مباديء عمليات تشكيل المعادن، حارث الجبوري
- Groover, Fundamentals of Modern Manufacturing, 4th Ed
- Kalpakjian, Manufacturing Engineering and Technology, 6th Edition in Si Units
- Technology of production and workshops, Shapman, part I.
- Workshop technology by W. A. J. Chapion.
- Material and processes in manufacturing, Paul Degarmo.
- Introduction to Manufacturing Process, John A. Schey.
- The Science and Engineering of materials, Askeland, D.R., 5th edition, Thomson 2006.