The University of Jordan
School of Engineering
Industrial Engineering Department
Spring 2020

Course name:	Manufacturing Processes 1/ Metal Forming		
Course code:	IE 0936311		
Credits hours	3		
Contact hours/room:	Section 1: 08:30 – 09:30 (Sun, Tue, and Thu @ IE 101) Section 2: 08:30 -10:00 (Mon, and Wed @ EW 101) OH: Sun, Tue, and Thu 10:30 – 11:00 and 12:30 - 13:00		
Course instructor's name, E-mail, and phone:	Dr. Yazan Al-Zain		
	y.alzain@ju.edu.jo		
	22732		
Course Coordinator:	Dr. Yazan Al-Zain		
Textbook:	Principles of Modern Manufacturing (Global Edition), by Mikel Groover, Wiley Publishers		
Other reference(s):	Materials Science and Engineering, 9th edition, by William D Callister, Wiley publishers.		
Course Description:	Mechanical behavior and forming of metals, different types of mechanical behavior and main factors affecting it. Yield criteria, representative stress and representative strain, work due to plastic deformation, classification of forming processes with respect to strain rate and temperature. Temperature rise in dynamic forming. Bulk deformation processes: forging, extrusion, rolling, rod and wire drawing. Sheet forming processes: blanking, deep-drawing and bending. (As per 2015 plan catalog description).		
Providing Department:	Industrial Engineering		
Prerequisite Course:	IE 0906273		
Course type	Mandatory		
	Method	**Weight %**	**Date**

Assessment Methods:	Project / Presentation	10	23/4/2020
	Mid Exam	30	25/3/2020
	Project / Product	10	23/4/2020
	Final Exam	50	To be announced

	#	After successful completion of this course, the student will be able to	SO
Course Learning Outcomes:	**CLO1**	Understand the various bulk-metal deformation processes	**1**
	CLO2	Choose the proper bulk-metal deformation process for the particular application	**2**
	CLO3	Understand the various sheet-metal deformation processes	**1**
	CLO4	Choose the proper sheet-metal deformation process for the particular application	**2**
	CLO5	Work within a group, and deliver an effective presentation	**3**

	Week #	Topic
Brief list of topics	1-2	Introduction To Manufacturing Engineering (MfgE): What is manufacturing, Manufacturing industries and products, Materials in manufacturing, classification of manufacturing processes, and introduction to plasticity theory and behavior.
	3-4	Mechanical Properties of Metals: Introduction to mechanical properties, stress-strain relationships; tensile properties; compression properties; bending and testing of brittle materials; shear properties; effect of temperature on properties; fluid properties.
	5-8	Bulk-metal Deformation Processes: Introduction; rolling types and analysis; other deformation processes related to rolling, forging types ad analysis; forging hammers and presses; other deformation processes related to forging, extrusion types ad analysis; defects in extrusion; wire and bar drawing.

	9-12	Sheet-metal Deformation Processes: Introduction; Cutting operations (shearing, blanking and punching); Cutting operations and its engineering analysis; other sheet-metal cutting operations; bending operations and its types; engineering analysis of bending; other bending and forming operations; drawing and its mechanics and analysis; other drawing operations; defects in drawing; other sheet-metal forming operations; dies and presses for sheet-metal processes; sheet-metal operations not performed on presses; and bending of tube stock.
	13-14	Projects Discussion
	15	Revision
	16	Final Exam
Important Notes:	• Do not hesitate to ask questions • You are required to bring a notebook and take notes in classes. • Students are expected to attend every class session and they are responsible for all material, announcements, schedule changes, etc., discussed in class. • Discuss the assignments among yourselves • Don't Cheat; direct copying of others work will NOT be allowed or tolerated and will result in a reduction of grade. If you are found to be cheating in any way, on an exam or assignment, even signing the roll sheet for another student, you will be given an "F" for the course. There will be no exceptions. • All cases of academic dishonesty will be handled in accordance with university policies and regulations. JU policy requires the faculty member to assign ZERO grade (F) if a student misses 15% of the classes that are not excused, and 20% of the classes that are excused • Students are expected to be ready to take a quiz any time they have a class. There will be no make-up quizzes or home works. • Any students with disabilities who need accommodations in this course are encouraged to speak with the instructor as soon as possible to make appropriate arrangements for these accommodations.	

	The B.Sc. in industrial Engineering program enables students to achieve, by the time of graduation the following program learning outcome (SOs)
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	An ability to communicate effectively with a range of audiences
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies