The University of Jordan
School of Engineering
Department of Mechatronics Engineering
1st Semester – A.Y. 2016/2017

Course: Engineering Materials and Manufacturing Technology MX 0908243 (3 Cr. – Mandatory Course)

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Course Website: http://eacademic.ju.edu.jo/o.habahbeh/Material/Forms/AllItems.aspx

Catalog Data: Material structure, Fundamentals of mechanical behavior of materials, Manufacturing properties of metal, Phase diagrams and heat treatment, Casting processes, Bulk deformation processes: forging, drawing, rolling, and extrusion. Sheet metal forming processes: blanking, piercing. Metal removal processes: Turning, drilling, milling, shaping, broaching.

Prerequisites by Course:
- General Physics I – 0302101.

Prerequisites By Topic: The student should have the basic knowledge of Physics and engineering mathematics

Textbook:
- Manufacturing Engineering and Technology, Serope Kalpakjian and Steven R. Schmid, Pearson, 2014, 7th Edition.

References:
- Lecture notes

Schedule & Duration: 16 Weeks, 29 lectures (75 minutes each) plus exams.

Minimum Student Material: Textbook, class handouts, scientific calculator, and an access to a personal computer.

Minimum College Facilities: Classroom with whiteboard and projection display facilities, library.

Course Objectives: The course provides the student with general overview of Material structure and properties, including Fundamentals of mechanical behavior of materials, Manufacturing properties of metal, Phase diagrams and heat treatment, Casting processes, Bulk deformation processes: forging, drawing, rolling, and extrusion, as well as sheet metal forming processes such as blanking and piercing, and Metal removal processes such as Turning, drilling, milling, shaping, and broaching.

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should:

1. Understand material structure (a)
2. Understand mechanical behavior of materials (a)
3. Define Phase diagrams and heat treatment, Casting processes, Sheet metal forming processes: blanking and piercing. (a)
4. Recognize manufacturing properties of metal (a)
5. Identify Bulk deformation processes: forging, drawing, rolling, and extrusion. (a)
6. Define and analyze metal removal processes: Turning, drilling, milling, shaping, and broaching. (a, e)

Course Topics:

	Topic Description	Hrs
1.	Material structure	**3**
2.	Fundamentals of mechanical behavior of materials	**4**
3.	Manufacturing properties of metal	**4**
4.	Casting processes	**5**
5.	Bulk deformation processes: forging, drawing, rolling, and extrusion.	**7**
6.	Sheet metal forming processes: blanking, piercing.	**5**
7.	Metal removal processes: Turning, drilling, milling, shaping, broaching.	**8**

Required book chapters and sections:
Introduction, Chapters 1-5, 10, 13, 14, 15, and 21. Sections 6.1, 7.1, 8.1, 9.1, 11.1-11.4, 16.1-16.6, 17.1, 22.1, 23.1-23.5, 24.1-24.6, 30.1, 31.1, 32.1, and 34.1.

Ground Rules:

Attendance is required and highly encouraged. To that end, attendance will be taken every lecture; Absence of more than *7 hours* will result in the expulsion of the student from the course.

Assessments:

Exams, Quizzes, and Assignments.

Grading policy:

First Exam		**20%**
Second Exam		**30 %**
Final Exam		**50 %**
	Total	**100%**

Last Updated:

Oct. 2016