Philadelphia University
Faculty of Engineering
Department of Mechanical Engineering
First Semester, 2009/2010

Course Syllabus

Course Title: Production Processes	**Course code: (620461 + 620463)**
Course Level: 3	**Course prerequisite (s) and/or co requisite (s):** **Engineering Materials Properties (620361)**

Course description:

To introduce the students with the fundamentals of: mechanical behavior of materials, bulk deformation processes, material removal processes, sheet metal forming processes and modern manufacturing systems.

Course objectives: At completing this course the student should:

- Understand different types of mechanical behavior of materials.
- Classify the forming processes with respect to temperature & strain rate.
- Understand the forging, rolling, extrusion & rod drawing.
- Calculate the energy & press capacity required for the previous processes.
- Understand the mechanics of metal removing processes.

Course components

- **Books (title , author (s), publisher, year of publication)**

  Manufacturing Processes for Engineering Materials, S. Kalpakjian, ,3rd Edition.

Teaching methods:

- 2 Lectures a week
- 1-2 Appointments for tutorials and discussion after each chapter

Learning outcomes:

- Knowledge and understanding

  The student should be able to understand the basic classification of stress and strain and manufacturing processes.

- Cognitive skills (thinking and analysis).

The students should link the concepts that they are learning with the real applications by giving live examples where the subject concepts are applied.

- Communication skills (personal and academic).

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 50 marks

Allocation of Marks	
Assessment Instruments	**Mark**
First examination	**20**
Second examination	**20**
Final examination: 50 marks	**50**
Reports, research projects, Quizzes, Home works, Projects	**10**
Total	**100**

Documentation and academic honesty

- Documentation style (with illustrative examples)

Students will be given the key solution after each exam to compare with their answers as well as the marking scheme. If any has an objection then the supervisor should consider it based on the key solution and the marking scheme. If the student has extra marks then he it should be added to him

- Avoiding plagiarism.
  The university has strict rules about plagiarism and it will be considered where it is necessary.

Course/module academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	Introduction	
(2)	Fundamental of mechanical behavior of materials: Tension	**Quiz at the end of the chapter.**
(3)	Fundamental of mechanical behavior of materials: ductility	
(4)	Fundamental of mechanical behavior of materials: Torsion, flexure, hardness fatigue and creep	
(5)	Bulk deformation processes: Forging	**Quiz**
(6) First examination	Bulk deformation processes: Rolling	
(7)	Bulk deformation processes: Extrusion	**Quiz**
(8)	Bulk deformation processes: Rod, wire and tube drawing	**Quiz**
(9)	Bulk deformation processes: Die manufacturing methods	
(10)	Bulk deformation processes: Applications	**small related project**
(11) Second examination	Material removal processes: Mechanics of chip formation.	**Quiz**
(12)	Material removal processes: Cutting process for production various shapes	
(13)	Material removal processes: Mechanics of grinding	**small related project**
(14)	Sheet metal forming processes: Shearing	**Quiz**
(15)	Sheet metal forming processes: Deep drawing formability of sheet metals	
(16) Final Examination	Modern Manufacturing Systems **Revision**	

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references

Books

1. De-Garmo, Paul E., Black, J Temple and Kosher, R.A., Materials and Processes in Manufacturing, Mcmillan, latest edition.
2. Schey J.A., “Introduction to Manufacturing Processes, Prentice Hall.