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

Course Syllabus

Course Title: Materials science	**Course code: 620361**
Course Level: 3th year	**Course prerequisite (s) and/or corequisite (s):**
Lecture Time: 11:10-12:10 M, T	**Credit hours: 3**

Academic Staff Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr. J. Abu Qudeiri	Assis. Prof	Dept E61209	10:00-12:00	jqudeiri@philadelphia.edu.j

Course module description:

To introduce the students with the fundamentals of: Metal structures and crystallization, plastic deformation, material failure, alloys, phase diagrams, iron-iron carbide equilibrium diagrams, and heat treatment of materials

Course module objectives:

At completing this course the student should:

- Identify the basic classifications, bonding, and structures of the most industrially important materials.
- Recognize the materials strengthening processes.
- Know the materials failure mechanisms.
- Distinguish between main steel types.

Course/ module components

- **Books (title, author (s), publisher, year of publication)**
  Title: Materials Science and Engineering: An Introduction,
  Author: W. D. Callister
  Publisher: Prentice Hall
  Edition :, 6th ed. 2004

- **Support material (s) (vcs, acs, etc).**
- **Study guide (s) (if applicable)**

- **Homework and laboratory guide (s) if (applicable).**

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 engineering materials and their failure mechanism and using property material for desired structure

  Cognitive skills (thinking and analysis).

  Some assigned projects aim to develop the thinking and analysis capability of the students
- Communication skills (personal and academic).
  Not applicable
- Practical and subject specific skills (Transferable Skills).
  Not applicable

Assessment instruments

- Quizzes.
- Home works
- project
- Final examination: 50 marks

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

Documentation and academic honesty

- Documentation style (with illustrative examples)
- Protection by copyright
- Avoiding plagiarism.

Course/module academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	• Introduction	
(2)	• Atomic structure and bonding	
(3)	• Atomic structure and bonding	
(4)	• Crystalline structure	
(5)	• Crystalline structure	
(6)	• Dislocations and plastic deformation	homework
(7)	• Dislocations and plastic deformation	
(8) First Examination	• Dislocations and plastic deformation	Quizze
(9)	• Material failure	
(10)	• Material failure	
(11)	• Phase diagrams	Quizze
(12) SecondExamination	• Phase diagrams	
(13)	• Iron and steel	project
(14)	• Iron and steel	
(15)	• Glasses and polymers	Quizze
(16) Final examination	• Glasses and polymers	

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. **W. F. Smith, and J. Hashemi, 2006, "Fundamentals of Materials Science and Engineering", 4th ed., McGraw Hill, Boston.**
2. **V. B. John, 1992, "Introduction to Engineering Materials", 3rd ed., ELBS.**

Journals

- Journal of materials science and engineering