



Arab Academy for Science, Technology & Maritime Transport
College of Engineering & Technology
Mechanical Engineering Department

University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

Form no. (12): Course Specification

1- Course Data

Course Code: ME 274	Course Title: Materials Science	Academic Year/Level: 2nd year / 3th semester	
Specialization: Mechanical	No. of Instructional Units 3 credits	Lecture 2 hrs.	Practical 2 hrs.

2- Course Aim

- To give the student a sound background in the science of engineering materials
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3- Intended Learning Outcomes

a- Knowledge and Understanding	Through knowledge and understanding, students will be able to: a.3) Characteristics of engineering materials related to the discipline a.4) Principles of design including elements design, process and/or a system related to specific disciplines. a.5) Methodologies of solving engineering problems, data collection and interpretation a.p.7) Basic theories and principles of some other engineering and mechanical engineering disciplines Providing support to mechanical power and energy disciplines.
b- Intellectual Skills	Through intellectual skills, students will be able to: b.12) Create systematic and methodic approaches when dealing with new and advancing technology.
c- Professional Skills	Through professional and practical skills, students will be able to: c.6) Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs. c.9) Demonstrate basic organizational and project management skills. c.11) Exchange knowledge and skills with engineering community and industry c.12) Prepare and present technical reports

d- General Skills	<p>Through general and transferable skills, students will be able to:</p> <p>d.3) Communicate effectively</p> <p>d.5) Lead and motivate individuals</p> <p>d.6) Effectively manage tasks, time, and resources</p> <p>d.7) Search for information and engage in life-long self learning discipline</p> <p>d.8) Acquire entrepreneurial skills</p> <p>d.9) Refer to relevant literature</p>

4- Course Content

Week No.1	Classification of Engineering Materials – General Introduction
Week No.2	Atomic Bonding in Solids
Week No.3	The Crystalline Structure of Materials
Week No.4	The Crystalline Structure of Materials
Week No.5	The Crystalline Structure of Materials
Week No.6	Properties, Testing, and Inspection of Engineering Materials
Week No.7	Properties, Testing, and Inspection of Engineering Materials. / 7th week evaluation
Week No.8	Properties, Testing, and Inspection of Engineering Materials
Week No.9	Introduction to Thermal Equilibrium Diagrams
Week No.10	Introduction to thermal equilibrium diagrams
Week No.11	Non-Destructive Testing
Week No.12	Heat Treatment of Metals . / 12 th week evaluation
Week No.13	Heat Treatment of Metals .
Week No.14	Corrosion: An Introduction
Week No.15	General Revision

5- Teaching and Learning Methods

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

6-Teaching and Learning Methods for Students with Special Needs

- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

Engineering Requirements and Design Considerations in college Buildings and its Leading Passages

- The design of college buildings and pedestrian passages leading to it are sloppy to allow the transportation of the handicapped;
- Doors are wide enough to let wheel chairs pass through easily and conveniently.
- Lifts are provided for movement between floors.
- Doors are made from light weight materials to make it easy for the handicapped suffering from weakness in limb muscles or those handicapped using prosthetic limbs to deal with them with the least muscular effort.
- Class floors are made from non-slippery materials to prevent falls on the part of the handicapped.
- Sudden changes in the floor level are prevented.

Design Considerations of the Classes

- Class boards are placed at 60 cm high to allow wheeled chair users or those suffering from limited arm mobility use them.
- Enough spaces are left between seats and benches to prevent hindering the movement of wheeled chairs between them.
- Handicapped students sit among normal people in class to be able to interact with them. Nevertheless, in urgent cases according to the nature of the disability, the handicapped students sit in fixed suitable places whether at the front or the back of the class.
- Handicapped students sit close to the main exits of the class to be able to evacuate in case of emergencies.

Academic Support:

- The general academic advisor appoints an academic supervisor for handicapped students.
- Continuous follow ups are made for handicapped students after each assessment to evaluate their academic level of achievement

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes.
	2-Class Activities (Reports, Discussions, -----) to assess The Intellectual Skills.

b- Schedule:	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7 th Week Assessment 12 th Week Assessment Continuous Assessments 16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Evaluation 12 th Week Evaluation Final-term Examination Oral Examination Practical Examination Semester Work Total	30 % 20 % 40 % 00 % 00 % 10 % 100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	<ul style="list-style-type: none"> W.D Callister “ Materials Science and Engineering - an Introduction” , 4th edition , Wiley, Latest Edition
c- Recommended Books	<ul style="list-style-type: none"> J.Shackelford “ Introduction to Materials Science for Engineering” , 2nd edition , Macmillan, 1990 R.Flinn & P. Trojan “ Engineering Materials and their Applications “ 4th edition , Houghton Mifflin, 1990 B.Hull& V. John “ Non-Destructive testing “ , Macmillan ,1988
d- Periodicals, Web Sites, etc.	N/A

Course Instructor: Dr. Mohamed Fahmy

Head of Department: Prof. El-Sayed Saber

Program Manager: Prof. El-Sayed Saber

Dean of College of Engineering and Technology of AASTMT

Name: Prof. Moustafa Hussein Aly

Signature:

Executive Manager of Quality Assurance Center of AASTMT

Name: Prof. Aziz Ezzat

Signature: