University: Cairo Faculty: Engineering Department: Aerospace Engineering

Course Specifications

Programme(s) on which the course is given: **B. Sc. In Aerospace**

Major or Minor element of programmes:

Department offering the programme: **Aerospace**

Department offering the course: **Mechanical Design & Production**

Academic year / Level: **1st year Aerospace**

Date of specification approval: March 2015.

A- Basic Information

Title: Material Science Code: MDP 120

Credit Hours:
Lecture: 2 (4 hrs) Tutorial: Practicals: 1 (2 hrs) Total:3 (6 hrs)

B- Professional Information

1 – Overall Aims of Course

This course is designed to give the students in Aerospace Engineering the knowledge of the main mechanical properties of metals and non metals and thermal stresses and its effect.

2 – Intended Learning Outcomes of Course (ILOs)

a- Knowledge and Understanding:

By the end of this course the students gain knowledge in:
a1- Crystalline Materials
a2- Metallic & non metallic materials & alloys
a3- Material Behaviour
a4- Thermal Stresses
a5- Fatigue, Impact, corrosion and material cracking

b- Intellectual Skills

b1- Realize the Difference between metals and non metals
b2- Apply basic concepts to analyze thermal stresses
b3- Perform fatigue and impact tests

c- Professional and Practical Skills

c1-Diagnose material cracks
c2- material selection and testing

d- General and Transferable Skills

d1- Report preparation.
d2- Management of team work.
d3- Participation in team work**.**

3- Contents

Topic	No. of hours	Lecture	Tutorial/Practical
Crystalline Materials	10	3	2
Metallic & non metallic materials	12	4	2
Alloys	8	2	2
Material Behaviour	8	2	2
Material Testing	16	4	4
Thermal Stresses	12	4	2
Fatigue	6	1	2
Impact	6	1	2
Corrosion	6	1	2
Material Cracking	8	2	2

4– Teaching and Learning Methods

4.1- Teaching lecture method (including numerical examples).
4.2- Learning preparation of the lab.

5- Student Assessment Methods

5.1 Final written exam to assess knowledge & understanding of subjects.
5.2 Mid-term exam to assess knowledge & understanding of subjects.
5.3 Reports to assess the description of the lab.

Assessment Schedule

Assessment 1 Reports	Week: distributed over all weeks.
Assessment 2 Mid-term	Week: 9.
Assessment 3 Final	Week: end of term

Weighting of Assessments

Mid-Term Examination	20	%
Final-term Examination	66.5	%
Oral Examination		%
Practical Examination		%
Semester Work	13.5	%
Other types of assessment		%
Total	100	100%

Any formative only assessments

6- List of References

6.1- Course Notes
Lecture Notes.

6.2- Essential Books (Text Books)

6.3- Recommended Books
1. Fundamentals of Materials Science and Engineering - William D.

Callister Jr.

7- Facilities Required for Teaching and Learning

Data show, Material lab

Course Coordinator: Prof. Dr. Abdel Halim ElHabak

Head of Department: Prof. Ayman H. Kassem

Date: March 2015