INTERNATIONAL STUDY PROGRAM
UNIVERSITY OF TORINO

UNIVERSITÀ DEGLI STUDI DI TORINO

ID
TM35_Dip_Chim

Teach Mob – Visiting Professors
Academic year 2014/2015

1st term

COURSE TITLE
Selection and Use of Materials

Scientific area
Chemical Sciences

Department of Chemistry

Language used to teach
English

Course summary
This course is designed as an overview on properties and uses of the materials universe today available.
It aims at providing students who have acquired knowledge on the properties of each material and their basis, with a method for the selection and use of them for specific functions in diverse applications. The programme is as follows

I) The concept of selection of materials: motivation, processes, costs.

II) Selection based on mechanical and surface properties. Ashby's charts.

III) Technological properties of materials: friction, wear, thermal shock, fatigue, oxidation, corrosion.

IV) Non distructive evaluation.

V) Evaluation of use requirements and failure analysis; quality controls.

VI) Practicals on case studies and use of dedicated software.

Learning objectives
The student will acquire ability to evaluate the potentiality for use of different materials. This is achieved through the knowledge of both fundamental and technological properties in relation to the processing techniques of materials, to failure analysis and non-destructive testing.
The student will be able to understand the role of commodities and their criticality, to compare materials and processes in relation to industrial and societal requirements, to perform choices and failure analyses.

Lab activities
The course has a further laboratory module amounting to 2 CFU during which the students are exposed to case studies.

Visiting Professor Profile

Full Professor

The Visiting Professor should be a Materials Scientist, have proved experience in teaching Material Science subjects and well documented research activity. Since the course is aimed at providing students with a comparative broad view on materials, the Visiting Professor should have given courses, conferences and published papers in relation to this requirement.

Also, a general experience on thermodynamics, microstructural kinetics including nucleation, solidification processing, and properties of different types of materials will be appreciated.

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