



## INTRODUCTION TO MATERIALS' SCIENCE

<b>Enrollment year</b>	2015/2016
<b>Academic year</b>	2016/2017
<b>Regulations</b>	DM270
<b>Academic discipline</b>	CHIM/02 (PHYSICAL CHEMISTRY)
<b>Department</b>	DEPARTMENT OF CHEMISTRY
<b>Course</b>	CHEMISTRY
<b>Curriculum</b>	PERCORSO COMUNE
<b>Year of study</b>	2°
<b>Period</b>	2nd semester (01/03/2017 - 20/06/2017)
<b>ECTS</b>	6
<b>Lesson hours</b>	48 lesson hours
<b>Language</b>	ITALIAN
<b>Activity type</b>	ORAL TEST
<b>Teacher</b>	CAPSONI DORETTA (titolare) - 3 ECTS BINI MARCELLA - 3 ECTS
<b>Prerequisites</b>	Chemistry, mathematics and physics basic notions
<b>Learning outcomes</b>	<p>Section 1: The course aims at provide students with knowledge in the properties and application fields of some classes of materials (metals, metallic alloys, polymers) and in some techniques useful for their characterization.</p> <p>Section 2: At the end of the course the student should be able to properly define ceramics and composites and know their chemical and physical properties. He should also know the basis of the electron microscopy.</p>
<b>Course contents</b>	Part 1: Classification of materials. Structure and defects in crystalline solids. Structural characterization techniques of crystalline materials. Structure, properties and applications of metals, metal alloys, and polymers.

Part 2: Introduction to ceramics, glasses and composites and their chemical and physical properties (mechanical, optical, magnetic, electric and thermal). Examples on the main classes of ceramic materials and composites. Natural composites. Properties of materials: elasticity, plasticity, ductility, fragility, fatigue. Characterization techniques: Scanning Electron Microscopy, Atomic Force Microscopy, Scanning Tunnelling Microscopy

**Teaching methods**

Frontal lessons and material provided by the teachers

**Reccomended or required readings**

- 1) W.F. Smith, J. Hashemi "Scienza e tecnologia dei materiali" McGraw-Hill, III ed.
- 2) Material provided by the teachers

**Assessment methods**

Oral examination

**Further information**

**Sustainable development goals - Agenda 2030**

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