UNIVERSITÀ DI PAVIA

Anno Accademico 2020/2021

INTRODUCTION TO MATERIALS' SCIENCE

Enrollment year	2018/2019
Academic year	2020/2021
Regulations	DM270
Academic discipline	CHIM/02 (PHYSICAL CHEMISTRY)
Department	DEPARTMENT OF CHEMESTRY
Course	CHEMISTRY
Curriculum	PERCORSO COMUNE
Year of study	3°
Period	2nd semester (01/03/2021 - 18/06/2021)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	CAPSONI DORETTA (titolare) - 3 ECTS BINI MARCELLA - 3 ECTS
Prerequisites	Chemistry, mathematics and physics basic notions
Learning outcomes	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. 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.
Course contents	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	The course foresee frontal lessons. No tutoring activity is present and a minimum frequency is not required
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 to verify the knowledge of the materials'properties presented in the course and of the main characterization techniques.
Further information	Oral examination to verify the knowledge of the materials'properties presented in the course and of the main characterization techniques.
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile