



PHYSICAL CHEMISTRY III	
Enrollment year	2016/2017
Academic year	2016/2017
Regulations	DM270
Academic discipline	CHIM/02 (PHYSICAL CHEMISTRY)
Department	DEPARTMENT OF PHYSICS
Course	
Curriculum	Fisica della materia
Year of study	1°
Period	2nd semester (01/03/2017 - 16/06/2017)
ECTS	6
Lesson hours	48 lesson hours
Language	ITALIAN
Activity type	ORAL TEST
Teacher	GHIGNA PAOLO (titolare) - 3 ECTS CAPSONI DORETTA - 3 ECTS
Prerequisites	Basic knowledge of Physical Chemistry and Physics.
Learning outcomes	The course aims at provide students with knowledge in the area of solid state chemistry and in the structure-properties relationship of matter.
Course contents	<p>The course is devoted to the basic aspects of solid state physical chemistry and includes lectures on theory and application examples on the following topics. Symmetry in the solid state, phonons and lattice vibrations; Electronic properties of solids: tight-band model (LCAO), energy bands, patterns of reduced zone and extended zone, solutions to the zone boundary and number of states in a energy band; Comparison of properties in metals, insulators, semiconductors; Intrinsic conductivity and forbidden energy range; Electrons and holes, charge carriers and extrinsic conductivity (impurities): carriers mobility, lifetime and recombination mechanisms; p-n junctions, rectifier properties of the</p>

	junctions with some applications; Equilibrium point defects in stoichiometric and non-stoichiometric compounds and defects-property relations: electrical conductivity and diffusivity in solids. Heterogeneous kinetics, volume defects, phase nucleation, interface phenomena and threshold displacement interface mechanisms. Geometric models for studies of kinetics and mechanisms of reactions in the solid state.
Teaching methods	Lectures of theory and application examples. Solution and discussion of numerical exercises.
Recommended or required readings	P. A. Cox, "The electronic structure and chemistry of solids", Oxford Science Pub., 1999; A.R. West, "Solid State Chemistry and its applications", 2nd Ed, 2014. Michael Glazer and Gerald Burns, Space Groups for Solid State Scientists, 3rd Ed., 2013
Assessment methods	Oral
Further information	Oral
Sustainable development goals - Agenda 2030	\$lbl legenda sviluppo sostenibile