UNIVERSITÀ DI PAVIA

Anno Accademico 2016/2017

KINETICS AND SPECTROSCOPY FOR BIOTECHNOLOGIES

Enrollment year	2015/2016
Academic year	2016/2017
Regulations	DM270
Academic discipline	CHIM/02 (PHYSICAL CHEMISTRY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	ADVANCED BIOTECHNOLOGY
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	2nd semester (01/03/2017 - 14/06/2017)
ECTS	6
Lesson hours	48 lesson hours
Language	ITALIAN
Activity type	ORAL TEST
Teacher	SPINOLO GIORGIO (titolare) - 3 ECTS CAPSONI DORETTA - 3 ECTS
Prerequisites	=
Learning outcomes	The course aims both at providing additional expertise and enhancing previous background on various areas of Physical Chemistry, with particular reference to chemical kinetics and spectroscopy, and with attention to applications in biotechnology.
Course contents	The first part concerns the basic ideas about degrees of freedom in a chemical system, on quantization of energy levels, and on the temperature dependence of their occupancy. Interaction of electromagnetic radiation with matter, with an overview of the various spectroscopic techniques from X-rays to radio waves, showing the information provided by each of them. A few selected techniques will be discussed in more detail, as selected by students.

	Adsorption: basic ideas and models for the adsorption isotherms. Basic aspects of chemical kinetics (reaction order, rate constant, complex kinetic mechanisms, steady state), kinetics of enzyme catalysis, chain reactions, oscillating reactions. Computer simulation (Monte Carlo) approach to complex reactions and fit of experimental data.
Teaching methods	Lectures will be supplemented by exercises based on numerical computations.
Reccomended or required readings	The reference textbook is: P. Atkins, J. De Paula “Atkins’ Physical Chemistry” VII, Oxford University Press. The lecture notes are available.
Assessment methods	oral exam
Further information	oral exam
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile