UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

KINETICS AND SPECTROSCOPY FOR BIOTECHNOLOGIES

Enrollment year	2020/2021
Academic year	2021/2022
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	1st semester (01/10/2021 - 14/01/2022)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	GRANCINI GIULIA (titolare) - 3 ECTS CAPSONI DORETTA - 3 ECTS
Prerequisites	Knowledge of general chemistry
Learning outcomes	The course aims at providing additional expertise in 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	Basic aspects of chemical kinetics. Complex kinetic mechanisms, steady state approximation, kinetics of enzyme catalysis, chain reactions, oscillating reactions. Computer simulation approach to complex reactions and fit of experimental data. Adsorption: basic ideas and models for the absorption isoterms. The fundaments of FT-IR, UV, Raman and absorption spectroscopies. All these tecniques will be afforded with specific reference to examples

	of interest in the biotechnology field. The Bases of thermal analysis. Experimental activity is foreseen.
Teaching methods	Lectures will be supplemented by: (i) exercises based on numerical computations for chemical kinetics; (ii) experiments on UVVIS spectroscopy.
Reccomended or required readings	The needed material will be provided by the teacher. The lecture notes are available. The reference textbook, limited to some chapters, is: P. Atkins, J. De Paula "Atkins' Physical Chemistry" VII Ed. Oxford University Press (2002).
Assessment methods	Oral examination: the student will make a presentation of a selected argument among those discussed in the course.
Further information	Oral examination: the student will make a presentation of a selected argument among those discussed in the course.
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile