



UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

INDUSTRIAL BIOCHEMISTRY

Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/10 (BIOCHEMISTRY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	EXPERIMENTAL AND APPLIED BIOLOGY
Curriculum	Bioanalisi
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	CHIARELLI LAURENT ROBERT (titolare) - 6 ECTS
Prerequisites	To better attend the course, adequate knowledge of biochemistry and molecular biology is required.
Learning outcomes	The course is aimed to the description of the role of biochemistry and biotechnology in the industrial world. In this context, the course deal with the different biochemical processes involved in the various industrial processes, as well as the strategies used for the production of recombinant and bio-engineered enzymes, and their application in industry.
Course contents	Engineering, production, purification and characterization of enzyme with industrial application. Host organisms, strain improvement and physiological optimization. Process design and yield optimization. Screening techniques, protein and metabolic engineering. Main families of industrial enzymes: biochemical features and

	<p>commercial relevance. Industrial strategies of production, purification and formulation of commercial enzymes.</p> <p>Fermentation processes in pharmaceutical industry: production of vitamins, antibiotics, amino acids, therapeutic proteins. Practical applications of fermentation processes and enzymes in the agro-food industries: production of bread, wine and beer, dairy, sweeteners. Fermentations and enzymes in biofuels production. Enzymes in the textile industry, in detergency and tannery. Garbage and wastewater management</p>
Teaching methods	Frontal lessons.
Reccomended or required readings	<p>Material provided by the teacher.</p> <p>Suggested textbooks:</p> <p>Enzymes in Industry: Production and Applications. 2007. Wolfgang Aehle (Ed). John Wiley & Sons</p> <p>Biochimica industriale: Enzimi e loro applicazioni nella bioindustria. 2001. R. Verga, M.S. Pilone. Springer Science & Business Media.</p>
Assessment methods	Oral exam aimed at ascertaining the achievement of the objectives of the course.
Further information	During the course, additional teaching material will also be provided by the teacher.
Sustainable development goals - Agenda 2030	The goals