



BIOTECHNOLOGICAL MICRORGANISMS

Enrollment year	2019/2020
Academic year	2021/2022
Regulations	DM270
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOTECHNOLOGY
Curriculum	Chem- Pharma-Tech
Year of study	3°
Period	1st semester (01/10/2021 - 14/01/2022)
ECTS	6
Language	Italian

The activity is split

508329 - BIOTECHNOLOGICAL MICRORGANISMS MOD 1

508330 - BIOTECHNOLOGICAL MICRORGANISMS MOD 2



BIOTECHNOLOGICAL MICRORGANISMS MOD 1

Enrollment year	2019/2020
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/19 (GENERAL MICROBIOLOGY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOTECHNOLOGY
Curriculum	Chem- Pharma-Tech
Year of study	3°
Period	(01/10/2021 - 14/01/2022)
ECTS	3
Lesson hours	24 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	DE ROSSI EDDA (titolare) - 3 ECTS
Prerequisites	Basic knowledge of General Microbiology and Molecular Biology.
Learning outcomes	To offer knowledge of the characteristics of the main microorganisms involved in biotechnological processes and of the techniques that allow their isolation and identification. To offer knowledge and skills in areas of structure functioning and application of microorganisms in fermentation processes; to equip students understand the relevance of applied microbiology.
Course contents	Microorganisms commonly used in industrial Microbiology and Biotechnology: Escherichia coli, Streptomyces, Bacillus subtilis, lactic acid bacteria, Corynebacteria and Myxobacteria. Culture collections. Genetics and strain improvement. Fermentation and cell culture. Biotechnological applications of bacteria and viruses. Microbial insecticides. Plant growth-promoting bacteria.

Teaching methods	Lectures.
Reccomended or required readings	- Donadio S, Marino G. Biotecnologie Microbiche. Casa Editrice Ambrosiana, Milano. 2008. - Didactic material provided by teachers (Kiro web site).
Assessment methods	The examination is written.
Further information	==
Sustainable development goals - Agenda 2030	\$lbl legenda sviluppo sostenibile



BIOTECHNOLOGICAL MICRORGANISMS MOD 2

Enrollment year	2019/2020
Academic year	2021/2022
Regulations	DM270
Academic discipline	BIO/02 (SYSTEMATIC BOTANICS)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOTECHNOLOGY
Curriculum	Chem- Pharma-Tech
Year of study	3°
Period	(01/10/2021 - 14/01/2022)
ECTS	3
Lesson hours	24 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	RODOLFI MARINELLA - 3 ECTS
Prerequisites	At the beginning of the course introductory knowledge concerning mycology will be provide. To make the course as profitable as possible, the student should have basic notions of microbiology.
Learning outcomes	<p>To know how to frame the main environmental fungal taxa and their life cycle, acquire up-to-date knowledge of systematics;</p> <ul style="list-style-type: none">- be able to frame and describe the main metabolic potential of biotechnological interest, with particular reference to secondary metabolism;- be able to frame and describe the life dynamics of the main fungal groups producing extrolites;- know how to critically manage the main practical and application mycological aspects.
Course contents	Fungi as modular organisms: filamentous fungi, yeasts and yeast-like

	<p>fungi, dimorphic and polymorphic.</p> <p>Fungal growth, morphogenesis, principles of nutrition, structural peculiarities, with particular regard to those of biotechnological interest; basic presentation of the fungal genome with focus on transposable elements and micovirus.</p> <p>The updated systematics and taxonomy of the V kingdom, way of life, exploitation and environmental adaptation.</p> <p>How fungi fit into biotechnology: historical, recent applications and new potentiality.</p> <p>Presentation of the fungal phyla and, within them, of the main fungal taxa of biotechnological interest, with particular reference to their reproductive cycles and their peculiar metabolic, fermentative and adaptive characteristics, origin of potential application.</p> <p>Focus on the main categories of molecules of biotechnological interest and on extracellular enzymes, with reference to processes, substrates, influence of environmental factors.</p> <p>How to manage the fungal species useful for biotechnology: laboratory best practices, instruments, methodologies for strain growth and iper-production.</p>
Teaching methods	<p>Frontal lesson. During each lesson, both basic theoretical concepts and application aspects supported by specific examples will be explained. The main fungal species will be presented and discussed by means of a descriptive sheet. Students will be involved and motivated to discuss the topics considered.</p>
Reccomended or required readings	<p>Lessons will be conducted with exhaustive presentations, adequate for the comprehension of the course.</p> <p>Further teaching and in-depth material (i.e. paper, review,...) will be made available during of the lessons and will be in English (since it is unavailable in Italian).</p> <p>Out of self-interest, students may refer to "Handbook of Fungal Biotechnology" 2nd Ed., Taylor & Francis, 2003.</p>
Assessment methods	<p>Oral examination carried out together with module 1. Questions will be aimed at verifying the acquisition, by the student, of the topics presented during the course.</p>
Further information	<p>During the carrying on of the lessons it will be possible to dwell on some species of biotechnological interest that are subject of new reports by the international scientific community.</p>
Sustainable development goals - Agenda 2030	<p>Aspects concernong the innovative use of microfungi in the food industry will be considered within the goals of counteracting problems related to a poorly balanced nutrition and food safety.</p> <p>\$lbl legenda sviluppo sostenibile</p>