General information		
Academic subject	**Environmental Biotechnology (i.c)**	
Degree course	Environmental Biology LM/6	
Academic Year	2021-2022	
European Credit Transfer and Accumulation System (ECTS)		5
Language	Italian	
Academic calendar (starting and ending date)	II° Semester (7th March 2022-10th June 2022)	
Attendance	mandatory	

Professor/ Lecturer	
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Virtual headquarters	Microsoft Teams code: 87enxea.
Tutoring (time and day)	Monday-Friday 9 am- 4 pm, by appointment via email.

Syllabus	
Learning Objectives	The course aims to provide knowledge about the main biotechnological mechanisms used for the prevention, contrast and resolution of environmental damage resulting from human activities and for the enhancement of biodiversity with particular reference to modern biomolecular techniques for the study of biodiversity, microorganisms and molecules of biotechnological interest.
Course prerequisites	The knowledge of Ecology and Molecular Biology.
Contents	Biotechnology and environmental challenges. Microorganisms and molecules of biotechnological interest. Bioremediation. "Omics" sciences and their application in the biotechnology field. Bioinformatics tools for the study of microbial biodiversity and the identification of gene sequences of environmental interest. **Note**: the detailed contents will be provided at the beginning of the course.
Books and bibliography	- Biotecnologie microbiche di Stefano Donadio e Gennaro Marino. Casa Editrice Ambrosiana. Distribuzione esclusiva Zanichelli, 2008. - Microbiologia ambientale ed elementi di ecologia microbica di Paola Barbieri, Giuseppina Bestetti, Enrica Galli, Davide Zannoni. Casa Editrice Ambrosiana. - Biotecnologie molecolari di Terry A. Brown.
Additional materials	Course slides available

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
125	*32*	*12*	*81*
ECTS			
5	*4*	*1*	

Teaching strategy	
	The teaching includes lessons in dual mode (frontal and remote) with the use of PowerPoint and laboratory activities for the acquisition of knowledge about the main experimental methods adopted for the study of the issues addressed.
Expected learning outcomes	
Knowledge and understanding on:	Knowledge of environmental issues, biological resources and the main molecular and bioinformatics techniques for the study of environmental bio-based solutions, microbial biodiversity and molecules of biotechnological interest.
Applying knowledge and understanding on:	Knowledge of biomolecular methodologies and biological resources to solve environment issue and to study and preserve its biodiversity.

Soft skills	• ***Making informed judgments and choices*** At the end of the course, the student will have gained knowledges and tools relative to environmental questions, the effects of human activities on ecosystems and the possible strategies that could be adopted. • ***Communicating knowledge and understanding*** Use of the appropriate lexicon applied to the field of environmental biotechnology and molecular biology. • ***Capacities to continue learning*** At the end of the course, the student will have gained the ability to use scientific literature and databases for the study of available information and their reliability on environmental issues, and on the available biotechnologies. The student will have gained also the ability on the exploration of in silico data to identify molecules of potential biotechnological interest.

Assessment and feedback	
Methods of assessment	The acquired knowledge and skills will be verified by oral exam.
Evaluation criteria	• ***Knowledge and understanding*** The student must demonstrate that they have acquired basic knowledge on environmental issues and applicable biotechnologies. • ***Applying knowledge and understanding*** The student must be able to translate theoretical knowledge into methodological tools for solving scientific problems of a biological / environmental nature. • ***Autonomy of judgment*** The student must be able to evaluate, on the basis of the acquired knowledge, the experimental approaches for the study of environmental problems. • ***Communication skills*** At the end of the course, the student may be able to illustrate, in simple way and adequate vocabulary the main biomolecular methodologies applicable in the environmental field. • ***Capacities to continue learning*** The student must demonstrate that he has acquired the basic knowledge relating to the issues addressed and be able to find new information, applicable to the context studied.
Criteria for assessment and attribution of the final mark	The assessment will take into account both the understanding and reasoning on the biomolecular issues and methodologies addressed, and the ability to create 'links' between the various contents of the program and current environmental issues.
Additional information	