

General information	
Academic subject	<i>Applied Ecology</i>
Degree course	<i>Environmental Science (L32)</i>
Academic Year	<i>2021-2022</i>
European Credit Transfer and Accumulation System (ECTS)	6
Language	<i>Italian</i>
Academic calendar (starting and ending date)	<i>I semester (27 September – 14 January)</i>
Attendance	<i>Recommended attendance</i>

Professor/ Lecturer	
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Department and address	<i>Department of Biology, Via Orabona 4, Bari Italy</i>
Virtual headquarters	<i>Microsoft Teams – code 1fxw6hx</i>
Tutoring (time and day)	<i>Monday/Friday (10:30-11:30) by appointment</i>

Syllabus	
Learning Objectives	<i>Knowing the characteristics of the different environmental compartments and the processes that are triggered within them in order to learn the interactions between the biotic and abiotic components of ecosystems in natural conditions and under the effect of anthropogenic pressures.</i>
Course prerequisites	<i>Basic knowledge for the subjects related to biology, geology, mathematics, physics and chemistry.</i>
Contents	<ol style="list-style-type: none"> 1. <i>INTRODUCTION TO APPLIED ECOLOGY: Contents, methodologies; study cases;</i> 2. <i>ATMOSPHERE: Structure of the Atmosphere; Solar radiation; Atmospheric temperature, pressure and movements of air masses (Ventosity); General principles of climatology and meteorology; Ozone and catalytic processes of destruction;</i> 3. <i>AIR POLLUTION : Ozone and non-catalytic destruction processes, photochemical SMOG; CFCs, Nitrogen oxides and sulfur oxides; Atmospheric particulate PM10 and PM2.5; Indoor pollution; Wet deposits; CO2 and greenhouse effect and climate change;</i> 4. <i>REMOTE SENSING: Basic principles of remote sensing by satellite; GIS AND SIT (Territorial Information Systems and GIS) practical use in biology;</i> 5. <i>SOIL: Soil structure, nature, composition and evolution of soils in various ecosystems;</i> 6. <i>SOIL INJURY: Soil Pollution: Dumps;</i> 7. <i>SOIL DEPURATION: Soil organic pollutants: pesticides and fertilizers;</i> 8. <i>WATER: Summary of the Water Cycle with respect to the groundwater;</i> 9. <i>AQUATIC TROPHIC NETWORKS: Organization of trophic networks in aquatic environments; Damages in trophic structure and functions (domino effect); Biological damage related to Biomagnification;</i> 10. <i>SURFACE WATER POLLUTION: DL 152/06: Definition; Quality criteria; Acceptability limits; Quality objectives; Causal causes of water pollution;</i>

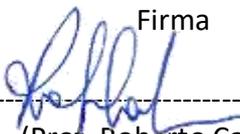
	<p>11. <i>THERMAL LOAD ASSESSMENT: Natural and anthropic phenomena of water overheating; Evaluation of acceptable thermal loads and estimation of biological effects;</i></p> <p>12. <i>TROPHIC LOAD ASSESSMENT: Causes of aquatic trophic load: Study of nitrogen and phosphorus; Evaluation of eligible trophic loads in waters;</i></p> <p>13. <i>ORGANIC LOAD ASSESSMENT: Causes of organic loading accumulation in water; Estimate of organic loading in water;</i></p> <p>14. <i>BIOMANIPULATION OF WATER BODIES: General Principles and Techniques of Biomanipulation and Bioremediation;</i></p> <p>15. <i>WATER REGULATIONS: D.L. 152/06; Community Directive 2000/60</i></p> <p>Laboratories: didactic approach to teaching methods of analysis in Meteorology and Climatology.</p>
Books and bibliography	<p>Provinj, S. Galassi, R. Marchetti: <i>Ecologia Applicata – Nuova Ed. 2008, Città Studi Edizioni</i></p> <p>BAIRD - <i>Chimica dell'ambiente. Nuova ed. 2008</i></p>
Additional materials	

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	36	22.5 Laboratory + 12 Field activity	79.5
ECTS			
6	4	1.5+0.5	
Teaching strategy			
<p>Lecture is the main teaching method. It is supported by laboratory activities aimed at acquiring practical skills useful for completing the learning of the theoretical concepts provided during the course. To support teaching, slides in Microsoft Office Power Point are used.</p>			
Expected learning outcomes			
Knowledge and understanding on:	<ul style="list-style-type: none"> ○ Know and learn the interactions between the biotic and abiotic components in marine and terrestrial ecosystems; ○ Know and learn the effects of pressures and impacts on marine and terrestrial ecosystems as well as their components. 		
Applying knowledge and understanding on:	<ul style="list-style-type: none"> ○ Skills to collect, process and analyses independently scientific data concerning environmental systems at different spatial and temporal scale; ○ Multidisciplinary analysis skills with attention paid to the modelling of environmental systems and quali-quantitative relations between the biotic and abiotic components. 		
Soft skills	<ul style="list-style-type: none"> ● <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> ○ Contextualization of environmental concerns subject, with interpretation and evaluation of collected, processed and analysed data in order to implement experimental model. ● <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> ○ Logical, articulated and autonomous exposition of information acquired with adequate linguistic properties. ● <i>Capacities to continue learning</i> 		

	<ul style="list-style-type: none"> ○ Ability to integrate learn notions, instrumental methodologies and data processing from different bibliographic sources both in Italian and in English in order to acquire new skills.
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Assessment and feedback	
Methods of assessment	<i>Oral test articulated on the entire program provided.</i>
Evaluation criteria	<ul style="list-style-type: none"> ● <i>Knowledge and understanding</i> <ul style="list-style-type: none"> ○ Demonstrate knowledge of the theoretical and modelling aspects of the entire program provided. ● <i>Applying knowledge and understanding</i> <ul style="list-style-type: none"> ○ Contextualization of acquired knowledge; ○ Assessment of multidisciplinary problem solving skills; ○ Adequacy in instrumental, methodological processing. ● <i>Autonomy of judgment</i> <ul style="list-style-type: none"> ○ Collect and assess useful data to determine autonomous judgments, including reflection on scientific and social issues connected to them. ● <i>Communication skills</i> <ul style="list-style-type: none"> ○ Organization of the knowledge acquired in a logical, independent and inedited version. ● <i>Capacities to continue learning</i> <ul style="list-style-type: none"> ○ Develop the skills necessary to undertake subsequent studies independently.
Criteria for assessment and attribution of the final mark	<i>Partial satisfaction of criteria listed above is a necessary condition for achieving a rating of 18/30. Rating higher than 27/30 will be awarded to students whose tests meet all five criteria listed above. To pass the exam, report, then a vote of not less than 18/30, student must demonstrate that have acquired sufficient knowledge of program arguments. To achieve a score of 30/30 and praise, the student must demonstrate, however, that has gained an excellent knowledge of all topics covered during the teaching.</i>
Additional information	

Bari, 31/08/2021

Firma


 (Prof. Roberto Carlucci)