Main course information	
Academic subject	Didactics of Ecology
Degree course	Environmental Biology
Degree class	LM-6
ECTS credits (CFU)	4
Compulsory attendance	Yes
Teaching language	Italian
Accademic Year	2019/2020

Professor/Lecturer	
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Tutorial time/day	Monday and Thursday 14:30-16:30

Course details	Pass-fail exam/Exam with mark out of 30	SSD code	Type of class
	Exam with mark out of 30	BIO/07	Lecture and laboratory exercises

Teaching schedule	Year	Semester
		II

Lesson type	CFU/ECTS	Lessons (hours)	CFU/ECTS lab	Lab hours	CFU/ECTS tutorial/workshop	Tutorial/workshop hours	CFU/ECTS field trip	Field trip Hours
	3	24	1	12				

Time management	Total hours	Teaching hours	Self-study hours
	100	32	68

Academic Calendar	First lesson	Final lesson
	March 2020	Maggio 2020

Syllabus	
Course entry requirements	Basic knowledge in Mathematics, Physics, General Chemistry, Animal and Plant Biology, Ecology.
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	
Knowledge and understanding	To acquire the methods for the knowledge of ecological systems (populations, communities and ecosystems) with a holistic overview and in which the interaction between abiotic and biotic components plays a decisive role in the functioning and regulation mechanisms of the ecological systems.
Applying knowledge and understanding	Application of the acquired knowledge for the Ecology teaching in Secondary School, through frontal teaching, observations and experimental surveys, laboratory experiments, and organization, analysis and evaluation of ecological data.
Making informed judgements and choices	Acquisition of autonomy in the evaluation and interpretation of experimental data, as well as in the promotion of investigations and educational experiences that can facilitate the acquisition of knowledge.
Communicating knowledge and understanding	Ability to spread the knowledge gained on methods and contents of ecology to secondary school students, promoting constructive discussion on ecology issues.
Capacities to continue learning	Acquisition of methodological skills in addressing the ecology teaching to arrive at the contents of this scientific discipline, fueling the desire for knowledge and promoting

	learning through the involvement of secondary school students in the various educational activities.

Syllabus	
Course content	The **aim** of the course is to present the contents through the methods of ecology with a didactic approach directed to secondary school students, solving the problems about the teaching of this scientific discipline for which the contents do not make the methods but through the methods one can get to the contents. **Issues of ecology education.** Ecology, environment and teaching. Ecology and interdisciplinarity. Ecology, the science of complexity. The importance of systematic knowledge, laboratory and field activities. **The Ecosystem**. An educational project to study the ecosystem: components, factors and functioning. From frontal lessons to field observation. System meaning and related examples. Examples of ecosystems and structural components. Organisms and environment interactions. Laboratory and field experiences. Effectiveness of multimedia tools for the organization and analysis of environmental data through the use of computer. The use of models in ecology: from models to conceptual maps. **The flow of energy in ecosystems**. Didactic methodology for learning energy flow in ecosystems. Laboratory didactic as a method for learning primary productivity and measurement methods in terrestrial and aquatic environments. Examples of energy transfer in food webs. "Who eats what" in the sea and on earth. Teaching methods of food webs through practical laboratory experiments, such as analysis of stomach contents in marine organisms. **The circulation of matter in ecosystems**. Didactic methods aimed at teaching the main biogeochemical cycles of the matter. Decomposition in ecosystems. Laboratory and field experiences. Elements of the climate and didactic exercises for their measurement. **Biotic components of the ecosystem** **Populations:** educational pathways for teaching the ecology of populations: from descriptive to modeling approach. **Communities:** Examination of the effectiveness of teaching tools for understanding the nature of interactions between species: observations on commensalism, mutualism, competition, predation and parasitism. Methodologies aimed at learning biodiversity in ecosystems. **Teaching approach for the teaching of environmental degradation:** from catastrophism to the systemic approach for the correct understanding of environmental degradation phenomena: pollution of the air, water, soil and biota matrices (eg greenhouse effect, global climate change, ozone hole , acid rain, environmental remediation). New teaching model: from environmental education to sustainable development (use of the planet's resources and renewable energies).
Course books/Bibliography	T.M. Smith, R.L. Smith - Elementi di Ecologia - Pearson Ed. Odum E.P. – ECOLOGIA. Un ponte tra scienza e società - Piccin
Notes	The student is invited to investigate particular topics also with other contributions available on the web.

Teaching methods	Lectures and seminars; direct experience acquired during laboratory and field exercises.
Assessment methods (indicate at least the type written, oral, other)	Oral examination. Presentation of an ecology lesson for students of Secondary School.
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are	Check of the acquisition of the topics covered in the course and of the methods of ecology. Check of the critical capacity to use environmental data for the purpose of understanding ecological phenomena. Check of the ability to transfer knowledge to students of Secondary School.
Further information	