LOGO DELLA STRUTTURA PRIMARIA

ACADEMIC YEAR: 2019-2020

COURSE: Ecology of agroecosystems

TYPE OF EDUCATIONAL ACTIVITY: Basic

TEACHER: Anna Rita Rivelli

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Language: Italian

ECTS: (lessons / tutorials/practice): 8	n. of hours: 56 hours of lessons 16 hours of practice	Campus: Potenza School: SAFE Program: LM Agricultural Sciences and Technologies	Semester: II

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course aims to provide basic knowledge on structure and functioning of ecosystems and agro-ecosystems in particular. The course focuses on the analysis and interpretation of the interactions between agriculture and environment, on the effects of cultivation management on productivity and rationalization of auxiliary energies, conservation and soil management to preserve fertility, the complexification of biocenosis, the role of biodiversity, the sustainability and environmental protection. The course also provides conceptual and methodological notes of the evolution of ecology in land use planning and the agriculture in protected areas and national parks.

• Knowledge and understanding: The student will acquire skills and abilities to understand the dynamics, processes and functioning of agro-ecosystems and the interaction with the environment, with particular reference to the most agro-ecological systems spread in the Mediterranean region and protected areas; ability to assess the crop practices and impact on the environment, the crop efficiency and rationalization of auxiliary energies, the rule and maintenance of ecological structures of high naturalistic value in agro ecosistems.
• Ability to apply knowledge and understanding: Ability to apply in concrete cases the acquired knowledge to define criteria and technical modalities for crop planning and management of agro-ecosistems and neighboring systems (forests, pastures, ecological regional networks, ect), with particular attention to agro ecosystems placed in areas subject to constraints, protection regime or of particular naturalistic value. Ability to recall and use in ecological key basic concepts already acquired in related and complementary disciplines.
• Autonomy of judgment: The student must be able to know how to evaluate and select the most appropriate tools and methodologies to set up correct agro-ecosystem management strategies. The student should also be able to plan, adapt and / or modify, through his/her autonomy of judgment, the cultivation practices in relation to the multiple and not always standardizable various endogenous and exogenous factors that determine the yield in the strict sense and the numerous other ecosystem services.
• Communicative Skills: The student must have the ability to explain in a simple way the concepts related to the holistic management of agricultural practices and interactions with the surrounding environment. The student must be able to present a written work and / or an oral presentation on the topics of the agricultural ecology using the correct language and the technical-scientific approach.
• Learning Skills: The student should be able, by using the knowledge gained during the course, to continuously update both technical and regulatory knowledge, and refine his/her skills by consulting texts and / or publications, participation to courses and seminars on topics related to agro-ecology and complementary disciplines.

PREREQUIREMENTS

- LT (3-year degree): Agricultural Sciences
- Agronomy and crop management, crop protection and environment risks

SYLLABUS

Lessons

Ecosystem: definition, structure and functionality. Interactions between organisms and environment. Cycle of matter

and energy. Productivity and food chains. Ecological niches and pyramids, trophic levels. The biogeochemical cycles: carbon, oxygen, nitrogen, phosphorus, sulfur and water. Role of biodiversity.
The agro-ecosystems: characteristics, evolution and components; the role of farmers. Productivity: Primary gross, net, growth indices. Cultural practices and environmental impact. Complexification of biotic communities, maintenance and management of soil fertility, rationalization of auxiliary energy. Soil and water pollution and remediation. Agriculture models, sustainable development and biodiversity conservation. Crop responses and climate changes. Elements of land use planning, agriculture in parks and protected areas.

Practices
Case studies on the management of agro-ecosystems, with particular reference to the Mediterranean environments. Use of process-based model to predict the carbon uptake and auxiliary energies of agroecosystems.

TEACHING METHODS

The course includes 56 hours of lessons and 16 hours practical (laboratory and/or open field). During practices will be asked to the students to analyze specific case studies.

EVALUATION METHODS

At the beginning of each lesson during the course, learning will be verified by randomly asking to the students questions to assess the ability to link the topics already covered during the previous lessons, and an oral examination at the end of the course during which three - four questions will be asked, one of which related to topics addressed during practices.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Odum E. 1988. Basi di Ecologia, Piccin Ed. Padova; Susmel L. 2001. Principi di Ecologia: Fattori ecologici, Ecosistemica, Applicazioni. CLEUP Editore, Padova
- Caporali F., Campiglia E., Mancinelli R. 2010. Agroecologia, Teoria e Pratica degli agroecosistemi. Città Studi Edizioni, Torino; Borin C. 1999. Introduzione all'ecologia del sistema agricoltura. CLEUP Ed. Padova.

INTERACTIONS WITH STUDENTS

- in the office at planned days/hours (Monday Thursday: 9:00 – 12:00);
- email: annarita.rivelli@unibas.it;
- telephone: 0971.205382

EXAMINATION SESSIONS (Forecast)

Calendar online: https://unibas.esse3.cineca.it/

EVALUATION BOARD

Prof. Anna Rita Rivelli; Dott. Susanna De Maria; Prof. Stella Lovelli; Prof. Piergiorgio Gherbin.

SEMINARS BY EXTERNAL EXPERTS YES