ANNO ACCADEMICO 2017/2018

CORSO DI STUDIO IN SCIENZE BIOLOGICHE
INSEGNAMENTO di ECOLOGIA 9CFU
DOCENTE Prof.ssa DE NICOLA

PROGRAMMA

Introduction

What is ecology? History of Ecology. Ecology, natural selection and evolution. The levels of biological organization. Ecosystem concept. Ecosystem: biotic and abiotic components. The emerging properties of ecosystem: stability, resilience and resistance. Ecosystem homeostasis. Ecosystem processes.

Interaction organism-environment

Environmental factors. Liebig Law and Shelford Law and Tolerance Limits. Definition of conditions and resources. Ecological niche concept. The physical environment: soil, water, nutrients, temperature, light, pH, salinity. Adaptations of organisms to physical environment.

Population and community ecology

Birth, mortality and biotic potential of populations. Population growth dynamics: "r" and "K". Interspecific interactions; predation, herbivory, parasitism, mutualism, competition. Communities and Emerging Properties. Key, dominant and rare species. Biodiversity. Factors affecting biodiversity. Succession: dynamic and evolution of ecosystems. The climax. Ecotones.

Ecosystem ecology

Energy flow and the matter cycle in ecosystems. The energy and the principles of thermodynamics. Energy transfer: primary and secondary productivity. Productivity distribution in the biosphere. Trophic levels: producers, consumers, decomposers. Ecological efficiencies. Energy flow in the trophic chains. Chain of grazing and debris. Decomposition. Trophic networks. Ecological pyramids. The main biogeochemical cycles: water, carbon, nitrogen, phosphorus, sulfur. The anthropogenic alterations of biogeochemical cycles.

Main ecosystems

Terrestrial ecosystems: the effects of climate and biomes. Climatic diagrams and climatic indices. Lakes: the seasonal cycle of lakes; eutrophization. Streamwaters: zoning of a stream; the concept of "river continuum". Marine ecosystems.

Reccomanded books

Cain, Bowman, Hacker. Ecologia. Piccin

Smith, Smith. Elementi di ecologia. Pearson

Odum, Barret. Fondamenti di Ecologia. Piccin

Townsend, Harper, Begon. L' essenziale di ecologia. Zanichelli

Ricklefs. L' economia della natura. Zanichelli