MASTER DEGREE IN MICROBIOLOGY

MICROBIAL ECOLOGY – Faculty of Sciences

Objectives:
The student achieves knowledge on basic ecological concepts and environmental applications. The student will have an updated knowledge on the state of the art in microbial ecology and of adequate methodology employed to obtain this.

Program:
Theoretical lectures
Microbial population and community dynamics: microbial growth in closed and in open environments. Ecology and dynamics of microorganisms (successions and consortia). Importance of biogeochemical cycles and trophic cascades. Microorganisms and sustainability of the planet: - Aeromicrobioloy: Sampling and analysis of airborne microorganisms. Bioaerosols. Biological corridors. Natural aquatic environments: surface waters and groundwater. Microbiology of drinking water. Soil microorganisms: biodiversity and biotransformation. Microbial Ecology in biotechnology: treatment; treatment .Treatment of wastewater, drinking water and solid waste. Biofertilizers - mycorrhiza, nitrogen-fixing and phosphate solubilizing microorganisms. Molecular methods in microbial ecology.

Laboratory:
Indicators used in microbial ecology: physical, chemical and biological. Strctural and functional diversity of microbial communities.

Evaluation methodology
Teaching methodologies include lectures and laboratory classes.
Evaluation includes experimental work and reporting (20%) and final examination (80%)
The approval rating is achieved with a mark a 9.5 (0-20 scale).

Recommended bibliography:
- MacArthur J. Vaun. 2006. Microbial Ecology. Elsevier. London
- Maier R. M., Pepper I.L., Gerba C.P. 2009. Environmental Microbiology. Second edition. Elsevier London.