

# COASTAL AND MARINE BIOLOGY AND ECOLOGY (LM51)

(Lecce - Università degli Studi)

## Teaching ECOLOGICAL INDICATORS AND BIOMONITORING

GenCod A005039

Owner professor Maurizio PINNA

**Teaching in italian** ECOLOGICAL INDICATORS AND BIOMONITORING

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**SSD code** BIO/07

**Reference course** COASTAL AND MARINE BIOLOGY AND ECOLOGY

**Course type** Laurea Magistrale

**Credits** 6.0

**Teaching hours** Ore-Attività-frontale: 54.0

**For enrolled in** 2020/2021

**Taught in** 2020/2021

**Course year** 1

**Language** INGLESE

**Curriculum** Curriculum Marine Biology and Ecology

**Location** Lecce

**Semester** Secondo-Semestre

**Exam type** Orale

**Assessment** Voto-Finale

**Course timetable**

<https://easyroom.unisalento.it/Orario>

## BRIEF COURSE DESCRIPTION

### Part 1 - *General aspects*

Biological indicators: definitions, characteristics and requirements. Disturbance and pollution of ecosystems: definitions, classification and types. Natural and anthropogenic disturbances: impact on the structure and functioning of ecosystems. Definition of reference conditions. Theoretical approaches to the use of biomarkers to assess the ecological status of ecosystems. The concept of ecosystem health and types of response to disturbances. Response of species to disturbance: sensitive species and tolerant species. General principles to develop the biological indices: EQS, EQR and reference conditions. The biological quality elements. Bioindicators at different levels of bio-ecological complexity: functional bioindicators at individual level, at population level, at community level. Species indicators, indices of richness, abundance indices, indices of evenness, diversity indices. Simple and multimetric bioindicators. Body size based bioindicators. Regional, national, European legislations and comparison with USA legislation.

### Part 2 - *Specific aspects for aquatic ecosystems*

Bioindicators and ecological indicators to assess the quality of aquatic ecosystems: rivers, lakes, transitional water ecosystems and marine-coastal. Sampling, processing and analysis of biological samples of ecological quality elements: phytoplankton, macrozoobenthos, macrophytes and macroalgae, fishes. Ecological indicators for rivers, lakes, transitional water ecosystems and marine and coastal environments: applications and specific cases of study.

The biomonitoring of aquatic ecosystems: definition, techniques and techniques of bio-accumulation, the main stages of biomonitoring studies, advantages and limitations of techniques biomonitoring, sampling strategies, interpretation of scale. The biomonitoring of aquatic ecosystems in Puglia: an application case.

## REQUIREMENTS

The knowledge of basic ecology is suggested.

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#### COURSE AIMS

The course provides knowledge about biological and ecological indicators, functional and structural, taxonomic and non taxonomic, and methodologies and applications used for assessing the ecological quality status of coastal-marine aquatic ecosystems. The topics will provide the theoretical principles, referring to the basic concepts of ecology, underpinning the development and application of biological indicators in relation to the requirements of the latest national legislation and European Directives. The program of the course is divided in two parts regarding "General aspects" and "Specific aspects for aquatic ecosystems". The Research Centre of Fisheries and Aquaculture of Acquatina di Frigole, branch of the DiSTeBA, hosts the course and provides all the indoor and outdoor facilities for lectures, field samplings and activities in laboratory.

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#### TEACHING METHODOLOGY

On-line/in presence lectures; On-line/in presence scientific seminars; Discussion and student talks on relevant topics and scientific articles; Practical activities including field samplings, analysis of samples and calculation of ecological indicators. The Research Centre of Fisheries and Aquaculture of Acquatina di Frigole, branch of the DiSTeBA, hosts the course and provides all the indoor and outdoor facilities for lectures, field samplings and activities in laboratory.

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#### ASSESSMENT TYPE

The assessment consists in the drafting of a review on a specific topic chosen by the student among those included in the program and in a talk of the student with the support of a PPT presentation.

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#### REFERENCE TEXT BOOKS

Specific and updated books are not available yet. The relevant didactic material is provided during the course including scientific articles, EU directives and Italian laws, project reports, book chapters, conference videos and papers.