



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Management of Aquatic Resources: Fisheries

2526-2-F7502Q018

Aims

The course examines key aspects and critical issues of aquatic resources management. Specifically, the course examines fishery and aquaculture productive systems focusing on ecosystem-based management approaches and innovative solutions to make both sectors more sustainable in a context of anthropogenic driven changes.

Knowledge and Understanding

The course will enable students to acquire theoretical and experimental skills related to the abiotic and biotic characteristics of ecosystems, interactions between organisms and between them and the physical environment, and ecosystem functioning in contexts related to fishing and aquaculture activities. Students will acquire basic knowledge of the ecological principles that govern ecosystem responses to human action (fishing and aquaculture) in order to propose analyses, monitoring protocols, and solutions to alleviate anthropogenic pressure, adopt mitigation measures, and guide adaptation to change. Students will acquire specialized scientific language.

Ability to apply knowledge and understanding

The student will acquire application skills in analyzing ecological processes, including those related to anthropogenic changes caused by fishing and aquaculture.

Making judgments

The student will acquire the ability to evaluate and interpret experimental data; assess the state of the environment and the effects of anthropogenic activities caused by fishing and aquaculture.

Communication Skills

The course will enable students to acquire appropriate communication skills and tools for presenting the results of ecological studies and for transmitting and disseminating information on topics related to the course content.

Learning Skills

The course will enable students to acquire adequate skills for independent development of additional skills, including: consulting bibliographical material, consulting databases and other online information, and developing basic knowledge tools for continuous knowledge updating.

Contents

The course will facilitate the understanding of the broad biological, social and economic aspects of fisheries science and the interplay between them with an overall ecological emphasis, by applying lessons learned and incorporation of emerging methods and data sources.

Detailed program

The course will specifically provide specific knowledge on:

Marine fisheries ecology: production processes – An introduction on how physical and biological processes drive the production of fishes; how species abundance changes in space and time.

Fishing gears and farming techniques - The scale, social and economic significance of global fishery and aquaculture; the species that are caught and farmed; fishing and farming strategies.

Stock assessment, ecosystem modelling, spatial planning - How make basic quantitative assessment of single and multispecies fisheries; estimate of needed parameters for assessment; the effects of uncertainty on the outputs.

Fish life histories and distribution - Functional and life-history traits of both fished and farmed species that make them vulnerable to fishing mortality and anthropogenic driven changes (e.g. climate change).

Fishing and farming effects on ecosystems - The impacts of fishing and farming on ecosystems; non-target species and habitats; mitigation measures and innovative solutions.

Evidence-based management and conservation options - The objectives of fishery and aquaculture management; factors that motivate and limit the fishing and farming activities, fishers/farmers behaviours; economic, social and biological reasons of overexploitation and extensive farming; how scientific advices can support the decision-making process and policy.

Prerequisites

None

Teaching form

21 two-hour e-learning lectures, Delivered Didactics

Textbook and teaching resource

Lesson slides (power point presentations)

Textbooks:

Jennings, S., Kaiser, M., & Reynolds, J. D. (2009). Marine fisheries ecology. John Wiley & Sons.

Kaiser, Michel J., et al. "Marine ecology: processes, systems, and impacts". Oxford University Press, 2020 (3th Edition).

Andersen, K. H. (2019). Fish ecology, evolution, and exploitation: a new theoretical synthesis. Princeton University Press.

Suggested readings from:

Levin, Simon A., et al., eds. The Princeton guide to ecology. Princeton University Press, 2012.

Semester

First semester

Assessment method

Oral examination: 3 questions related to the scientific themes addressed in class, of which: a) one topic selected by the student; b) one question to assess the knowledge on the related topics to test the availability of the student to link topics; c) one question related to the a specific practical aspects of the themes addressed in class with specific attention to practical solutions, tool and methods proposed in among those shown in class and in the slides: the student my offer practical example if required.

During the exam, the teacher will evaluate the knowledge of the relevant information provided in the course, the ability to correlate the information obtained from different sources and themes and the capacity to explain clearly and with an appropriate terminology the themes of the course.

Office hours

On appointment, by e-mail request.

Sustainable Development Goals

CLIMATE ACTION | LIFE BELOW WATER
