UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Marine Invertebrate Zoology

2425-1-F7502Q011

Aims

This course examines a wide panel of topics related to marine invertebrates and their symbiotic, environmental, and functional roles and interactions. The aim of the course is to provide concepts and applications in a context of modern zoology. Apart from classic systematics and base concepts for each invertebrate phylum, the course program covers many applicative issues related to these animals, ranging from bioprospecting activities to management and control of invasive species and cryptic ones.

1. knowledge and understanding: A the end of the course, the student will have acquired knowledge regarding the different levels of diversity and complexity of interactions in the marine invertebrate context, from those involving microbial organisms to those with the environment. 2) Applying knowledge and understanding: At the end of the course, the student will be able to apply the knowledge acquired during the course to other courses or thesis programs involving the issue of marine invertebrate zoology. 3) Making judgements: The student will be able to critically adopt the acquired knowledge and choose the most reliable approach to link the functional traits of organisms to their possible interactions, for example in a context of symbioses. 4) Communication skills: At the end of the course, the student will be able to describe clearly, and with an adequate language the different marine invertebrate phyla also in terms of evolutionary aspects and applied contexts (e.g., bioprospecting). 5) Learning skills: At the end of the course, the student will have the necessary knowledge to deal with the next studies that will require knowledge of zoology, symbioses, molecular identification of organisms and their interactions. Finally, the student will be able to associate and integrate the acquired knowledge with the concepts belonging to the successive courses.

Contents

Zoology deals with the study of animals (in this specific cours, the invertebrate ones). There could be many ways to treat such a wide topic. In this course, the systematics aspects are reduced to the very essential aspects, while more detailed information will be provided concerning the structure, biodiversity and interactions typical of each invertebrate phylum. Bioprospecting, integrative identification and conservation issues will be also discussed

Detailed program

INTRODUCTION TO MARINE INVERTEBRATE ZOOLOGY

- Importance of zoology

- Basic concepts (bauplan, evolution, diversity and interactions)

MARINE INVERTEBRATE PHYLA: SYSTEMATICS AND PRINCIPAL CHARACTERISTICS

- Protozoa

- Parazoa (Porifera and Placozoa)

- Eumetazoa and Radiata

- Platyhelminthes and Nemertea

- Rotifera and Nematoda

- Mollusca

- Annelida

- Arthropoda

- Lophophorata

- Echinodermata

FUNDAMENTALS OF MOLECULAR PHYLOGENETICS

"MINOR" INVERTEBRATE PHYLA

- Xenacoelomorpha

- Gastrotricha, Entoprocta, Cycliophora, Orthonectida

- Rhombozoa, Gnathifera

- Scalidophora

- Echinodermata

- Invertebrate Chordata

A FOCUS ON CNIDARIA

SYMBIOSES INVOLVING MARINE INVERTEBRATES AND BACTERIA

- Intracellular symbioses (base concepts)

- Nutritional symbioses

- Bioluminescent symbioses

APPLICATIVE ZOOLOGY: E-DNA AND MOLECULAR-BASED ADVANCES IN THE STUDY MARINE COMMUNITIES

Prerequisites

Basic concepts of zoology.

Teaching form

Two-hour lectures, in person delivered Didactics.

Textbook and teaching resource

PDF lessons, videos, and supporting scientific papers provided on the e-learning platforms.

Semester

Second semester

Assessment method

The verification of the knowledge aquired during the course will consist in an oral examination at the end of the course. There will be not intermediate tests. The examination will start with the critique discussion of a scientific article chosen by the student (and previously approved by the teacher), concerning the general issues treated in the lessons. The examination will continue with the discussion of the arguments included in the program of the course.

Office hours

Upon request by email to the teacher andrea.galimberti@unimib.it

Sustainable Development Goals

LIFE BELOW WATER