UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Zoologia

2021-1-E3201Q088-E3201Q077M

Aims

The contents of the Zoology module, of the course of Animal and Cell Biology, aim to provide the student with the knowledge related to the diversity of the animal kingdom in an evolutionary perspective. Specifically, the course aims to:

- present an overview of the animal kingdom

- recognize the evolutionary relationships between taxa

- give meaning to the morphological-functional adaptations forged by selective pressures and appeared during the course of adaptive radiation

The course includes mandatory practical activities in which some of the topics covered during the lectures will be deepened, which will allow to better appreciate the meaning of the morphological-functional adaptations. To this end, slides of zoological preparations and soil and aquatic meiofauna deriving from specimens specifically collected will be viewed using optical instruments (stereoscopes and microscopes).

The acquired knowledge will be preparatory for the continuation of the training course aimed at preparing expert figures in the different professions in the environmental field.

Contents

The course intends to address the issues of evolution and speciation, treating the distinctive features that have

appeared throughout the history of life in the various animal taxa from a phylogenetic perspective.

Detailed program

The course of Zoology will deal with the issues of evolution, speciation and adaptation. Emphasis will be placed on reproduction and sexuality, on reproductive cycles and strategies, as well as parental care. Phylogeny and the main criteria for the classification of animal groups will be discussed. Organization, reproduction and sexuality in Protists will be briefly presented. The main characteristics of the Metazoans will be described: the early stages of embryonic development, the appearance of body cavities, and the origin of Protostomes and Deuterostomes. Description of animal phyla will take place with particular regard to their organization, morphological-functional adaptation and their phylogenetic relationships.

Introduction:

1. Zoology, Biodiversity and Environmental Sciences

2. Concepts of biological evolution and key characters in the evolution of biological thought

3. The mechanisms of evolution and the concept of species

4. Meaning and mechanisms of reproduction

5. Structural organizations of the living

6. Cladistic vs. evolutionary systematics

7. The origin of the first organisms

8. The cell as a basic unit of the living and its organizations

9. The domains and Kingdoms of life - Origin of eukaryotes

10. Protists and protozoa - The origin of multicellularity

Systematic:

1. The characteristics of metazoans (Parazoa, Mesozoa and Eumetazoa)

2. Porifera. Diblastic and triblastic eumetazoa

3. The Radiata (Cnidaria and Ctenophora)

4. The Bilateria, process of cephalization

5. Protostomes and Deuterostomes

6. Acoelomates, Pseudocelomates and Coelomates

7. Acelomata, Lophotrochozoa (Platyhelminthes)

8. Acelomata, Lophotrochozoa (Nemertea & Gnathostomulida)

9. Pseudocelomata, Lophotrochozoa (Rotifera, Acanthocephala, Micrognathozoa)

10. Pseudocelomata, Lophotrochozoa (Entoprocta, Gastrotricha, Cycliophora)

11. Pseudocelomata, Ecdysozoa (Nematoda, Nematomorpha)

12. Pseudocelomata, Ecdysozoa (Kinorhyncha, Priapulida, Loricifera)

13. Celomata, Lophotrochozoa (Ectoprocta, Brachiopoda, Phoronida, Sipuncula)

14. Celomata Lophotrochozoa (Annelida)

15. Celomata, Lophotrochozoa (Mollusca)

16. Celomata, Chaetognatha

17. Celomata, Ecdysozoa (Onychophora, Tardigrada, Arthropoda)

18. Celomata, Ecdysozoa (Arthropoda Exapoda)

19. Deuterostomes (Echinodermata)

20. Deuterostomes (Emichordata)

21. The deuterostomes (Chordata), Urochordata and Cephalochordata

22. The deuterostomes (Chordata), Vertebrata

Practical part (mandatory):

1. Observation of preparations under the microscope and stereoscope

2. Preparation of soil and aquatic meiofauna samples and their observation on optical instruments

3. Laboratory observation of the morphological-functional adaptations of selected taxa

Prerequisites

None

Teaching form

The teaching activity will be organized in lectures (40 hours) and practical activities (10 hours) (remotely in case of prolonged health emergency) .

For this teaching, teaching support activities (tutoring) are provided both on-going and post-course, with simulation of the examination tests.

Textbook and teaching resource

Hickman et al. 2016. Zoologiy, 16/ed

Hickman et al. 2016. Aniaml diversity 16/ed

Semester

The lectures and the practical part will be delivered in the first year of the course in the first semester.

Assessment method

Oral test after passing a multiple choice test. 8 ordinary sessions are scheduled during the teaching breaks.

Multiple choice test: performed in a computer lab (Perception platform); 30 questions to be answered in a total time of 30 minutes. The student can choose between four options, among which there is the correct answer, two wrong

answers and also the possibility of not answering. Each correct answer allows you to acquire a point, each incorrect answer deducts half a point, while the non-answer totals zero points. The test is passed with a minimum score of 14 points. The score acquired does not mean with those obtained by the oral exam.

Oral test: deepening of the questions that were incorrectly answered in the multiple choice test and other questions aimed at ascertaining the acquired knowledge, both by lectures and practical part.

Office hours

By appointment upon request at the e-mail address: luciano.bani@unimib.it