UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

## Biology and Biology Teaching - 2

**2122-3-G8501R018-G8501R018M-T2**

### Course title

**BIOLOGY – FUNDMENTALS AND DIDACTICS WITH LABORATORY**

### Topics and course structure

**Synthesis of the program**

-The basis of Biology

-Biological systems: from cells to organisms

-The biological world: environment, evolution, biodiversity

-Ecology and environmental education

**Detailed program**

The main topics of Biological, Natural and Environmental Sciences will be part of the course, following the

proposed scheme:

- Definition of life
- Organic molecules and the chemistry of life
- Procaryotes and eucaryotes
- Animal and plant cells organisation
- Cell metabolism
- Cell division: mitosis and meiosis
- Inheritance of characters
- From single cells to complex structures: tissues and organs
- General function and structure of the human body
- Structure and function relationship: how the environment plays its role.
- Taxonomy and classification of the organisms
- Biological evolution
- Didactic of evolution
- The history of life
- The evolution of humans
- Fundamental aspects of biological systematic
- Fundamental features of plants
- Fundamental features of animals
- Ecology and environmental education
- Science communication

## Objectives

Biological structures and functions, evolution and environmental relationships are the core topics of the course.

Main objects are:

1. to know disciplinary contents and the appropriate scientific language
2. to learn the means for communicating the contents and the ways to propose them to the children of infant and primary school
3. to localize the contents into the environment, within evolution and ecological relations
4. to approach reading

## Methodologies

Lessons, active teaching methods, practical labs

## Online and offline teaching materials

Slides and supplementary materials discussed in classroom, and all additional material (e.g., videos, books, scientific papers) suggested during the lessons.

## Programme and references for attending students

***References***

1) Padoa-Schioppa E. *Metodi e strumenti per l'insegnamento e l'apprendimento della Biologia* Edises

2) It is necessary to refer to a text containing the main topics of Biology. A detailed high school text could be appropriate, or for a more detailed study, one of the following texts can be used:

- Sadava D et al., Elementi di biologia e genetica – quinta edizione- Zanichelli

- Sadava D et al., Biologia vol. 5. La biologia degli animali - Zanichelli

- Sadava D et al., Principi di Biologia - volume unico - Zanichelli

- Solomon et al., Fondamenti di biologia - EdiSES

3) All the students (attending and non attending) have to read one of the books to be chosen among those indicated by the teacher.

During the course additional material (papers and slides) could be suggested and provided and uploaded on site before the exam.

## Programme and references for non-attending students

The program for non-attending students is the same with the same bibliography.

## Assessment methods

Oral and written according to the followings.

Written test with closed and open questions. Closed questions aim at evaluating the basic knowledge and language property; open questions aim at verifying overall knowledge, and the ability to describe and connect

different topics.

Oral test will start from the discussion of possible critical points of the written test, and will be centered on the examination of detailed knowledge of all topics of the course (frontal lessons and laboratory).

Ongoing written and oral tests with the same overall structure as above are further proposed, as a possible choice by the students.

## Office hours

Monday from 16:30 to 18:00. Send an email before: (emilio.padoaschioppa@unimib.it)

## Programme validity

One academic year

## Course tutors and assistants

Claudia Canedoli

Matilde Forcella

Simone Masin

Noemi Rota