UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Biology Teaching

2223-1-F7501Q093-F7501Q105M

Aims

General objectives

General objectives are:

1. to provide the instruments for the comprehension of the basis and key concepts;
2. to provide the didactic knowledge and appropriate scientific language for teaching;
3. to connect the different subjects through a didactic project;
4. to stimulate through logic connections and different relations between the scientific subjects and within the same subject.

Specific objectives

The didactic module has specific aims to provide the skills to:

1. Identify key topics of Biology;
2. Logically connect the different topics;
3. Identify essential concepts, the keys to connect them, and how to argument them;
4. Provide examples of didactic means;
5. Develop communication skills in Sciences;
6. Provide the tools to organize practical activities (laboratory, group activities and discussions)

Contents

- The different levels of biological organisation
- From the cells to organisms
- The biological world

- Teaching tools
- Laboratory activities (1 CFU, 10 h)

Detailed program

The main topics of Biology will be presented and discussed, centring the attention on didactic means and methods to transfer knowledge and concepts instead of basic knowledge. In particular the following topics will be presented:

- The living organisms and their classification for the knowledge of the living world;

-Different levels of organisation for the comprehension of different biological scales;

-Metabolism and metabolic processes to understand the different activities of biological systems;

-Genetics and inheritance of the characters to understand the mechanisms, also related to evolution;

-Form and function in the organisms to understand the significance of biological structures related to their function and to the environment.

Laboratory activities 1 CFU (10 h) are part of the module including practical experiences and discussion groups on proposed topics. Aims of the laboratory activities are mainly related to the use of critical and logical skills, and to enhance the ability to connect different topics and subjects. They further aim at stimulating cooperation skills during group work.

Lab activities are divided in:

1. Use of biological models (animal and plant cells) and samples preparation for optical microscopy observation to understand the different dimensional scales; use of specific dyes to evidence organelles; comprehension and discussion on the roles of cell barriers and compartimentalization; discussion on structure and function relation; *incipit* questions.
2. Identification of suitable scientific papers and/or videos; single or group work aimed at identifying key concepts and connections in selected papers or videos;
3. Presentation by the students of selected papers and/or videos and general discussion on key concepts and didactic methods of presentation.

The same program is for attending and non-attending students.

Prerequisites

Basic knowledge of Biology will be considered acquired, and the references to texts and/or resources will be provided for integration or recap of the contents.

Teaching form

Lessons, labs including active teaching (group work and discussion).

Textbook and teaching resource

Lesson slides and supplementary material discussed during the course, recorded lessons. Links to video of biological content will be provided, along with additional books and/or papers. All additional material discussed during the lessons will be loaded on the platform.

Bibliography

- Longo C., Didattica della Biologia - Ledizioni

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

- Morris et al., Biologia - Come funziona la vita - Zanichelli

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

- Hills D et al., Fondamenti di biologia – Zanichelli

- Solomon et al., Fondamenti di biologia - EdiSES

- Solomon et al., Fondamenti di biologia - EdiSES

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

- Sadava et al., Biologia 3. L’evoluzione e la biodiversità- quinta edizione – Zanichelli

- Sadava et al., Biologia 4. La biologia delle piante – quinta edizione – Zanichelli

Semester

First semester

Assessment method

Oral with a didactic project presentation aimed at the evaluation of the basic Biological knowledge, skills to propose conceptual links and teaching tools, and to verify the appropriate language and communication skills.

Office hours

By mail appointment ()

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY | REDUCED INEQUALITIES | CLIMATE ACTION | LIFE ON LAND