



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Anatomia Comparata

2627-1-E1302Q086-E1302Q08602

Aims

The course provides 12 CFU and is divided into two modules: **Cytology and Histology** (first module) and **Comparative Anatomy** (second module).

The **comparative anatomy module** is divided into two parts. The first part will provide the student with the basic concepts related to the phases that regulate the development of Vertebrates (from fertilization to organogenesis), concepts that will allow them to understand the embryological derivation of organs, systems, knowledge necessary for anatomy. The content of the anatomy will provide the student with notions related to the anatomy of Vertebrates in a functional and evolutionary key. The theoretical concepts provided in the classroom will be followed by the laboratory experience.

1. Knowledge and understanding

At the end of the course, the student will acquire knowledge about the animal eukaryotic cell and the organelles that characterize it in morpho-functional terms and the organization of the tissues. Furthermore, the student will know the organization of organs, systems from a morpho-functional and comparative point of view and will be able to recognize the histo-anatomical preparations.

2. Applying knowledge and understanding

At the end of the course the student will be able to apply the knowledge acquired in point 1 to the subsequent subjects he will study in the following years.

3. Making judgements

The student must be able to critically process the acquired knowledge and choose the most appropriate approach to link the morpho-functional characteristics of the animal eukaryotic cell to more complex organization levels such as tissues, organs and systems.

4. Communication skills

At the end of the course, the student will be able to describe, with an appropriate scientific language, the cell organization and arrive, through the description of tissues and organs, to the systems.

5. Learning skills

At the end of the course, the student will have the skills to face the subsequent studies that require basic knowledge of cytology, histology and anatomy.

Furthermore, the student will be able to associate the knowledge learned with the concepts that he will assimilate in the subsequent studies that require cyto-isto-anatomical knowledge as prerequisites.

Contents

Comparative Anatomy Module: after an introduction to embryology, the study of the anatomical organization of Vertebrates will be addressed, considering the functional and evolutionary aspects. The lectures will be accompanied by the mandatory laboratory activity to observe histo-anatomical samples under the microscope

Detailed program

Comparative Anatomy

- General principles of embryology. From the zygote to the embryo: segmentation; gastrulation; organogenesis.
- Classification and main characteristics of the various classes of Vertebrates and their progressive evolution.
- Hierarchical organization: cell-tissues-organs-apparatuses / systems-organism.
- Tegumentary apparatus: functional and structural aspects. The tegument and derivatives in Vertebrates. Skin pigmentation.
- Digestive apparatus: general characteristics of the digestive tract in Vertebrates, microscopic aspects and function of the different sections of the digestive tract (esophagus, stomach, intestine). Liver and pancreas: morphology, function and relationship with the digestive apparatus.
- Respiratory apparatus: general characteristics in Vertebrates (gills and lungs) and its evolution in tetrapods.
- Uro-genital apparatus: anatomy and evolution of the excretory apparatus in Vertebrates. The functional unit of the kidney: microscopic aspects. Structural aspects of the testis (cystic and tubular) and of the ovary (sacciform and parenchymatous).

Laboratory: Comparative Anatomy

Microscopic observation of histo-anatomical preparations related to the topics addressed in class. A comparative analysis will be performed.

Prerequisites

Basic knowledges of Biology and Histology

Teaching form

Teaching language: Italian

Second semester - module of Anatomy (6CFU): 5 CFU in "Lesson" mode and 1 CFU in "Laboratory mode"

There are 20 Lessons of 2 hours each delivered in presence mode. Part of the lessons can be delivered in "interactive" mode in order to involve students during the lessons.

The teaching activities are delivered through **frontal lessons

Laboratory: 10 hours obligatory divided into 5 activities (each lasting 2 hours) carried out in interactive mode. This activity is aimed at studying biological tissues. The activity involves the use of the optical microscope for the observation of histo-anatomical samples.

The module of Comparative Anatomy is supported by **20 hours of tutoring activities** to support students throughout their studies in preparation for the exam. The activity is carried out in interactive mode in the presence of a tutor.

Textbook and teaching resource

In general, any University textbook of Comparative Anatomy is suitable. The student can choose one of the following texts:

Comparative Anatomy

Comparative Anatomy Manual. E. Giavini, E. Menegola. Published by EdiSes.
Histology text used in the previous semester.

On the e-learning page of the course, it will be possible to find:

-Copy of the slides used in classroom and in the laboratory;

- **Didactic material** (films, cards) made available by ** Pearson publishing house** for in-depth analysis of the Cytology topics covered in class
- Self-assessment quizzes** made available by **Zanichelli publishing house** for the Cytology topics covered in classroom
- useful links where the student can find histo-anatomical images.

Semester

Cytology and Histology: first semester

Comparative Anatomy: second semester

Assessment method

There are no tests in progress.

Assessment methods

Student assessment consists of two written tests and one oral examination.

The following are required:

- one **written test for the Cytology and Histology module**
- one **written test for the Comparative Anatomy module**

The written tests are carried out in a computer room (Moodle platform) and consist of closed-ended questions (true/false, multiple choice, single-answer), aimed at assessing knowledge of the course contents.

Passing the Cytology and Histology written test allows access to the Comparative Anatomy written test.

Passing both written tests is a requirement for admission to the oral examination.
The oral examination covers all the topics included in the course.

Assessment criteria

Written tests

- assess knowledge and understanding of the course contents
- for the Cytology and Histology module, they also assess the ability to recognize and interpret histological specimens

The written tests are intended to verify basic knowledge and do not directly contribute to the final grade.

Oral examination

- assesses knowledge and understanding of Cytology, Histology, and Comparative Anatomy
- evaluates the ability to link different levels of biological organization (cell, tissue, organ, organism)
- assesses the ability to recognize and describe histo-anatomical images
- evaluates critical thinking skills and the appropriate use of scientific terminology

Final grade

The final grade is expressed on a scale of 30 and is determined based on the oral examination.

The evaluation will consider:

- accuracy and completeness of knowledge
- ability to establish connections between topics
- clarity of presentation
- appropriate use of scientific language

Office hours

Appointment request by e-mail to: anita.colombo@unimib.it

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION
