UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Fundamentals of Human Physiology

2526-2-H4102D010

Aims

The course aims to provide knowledge about cellular functions at the basis of systems physiology. At the end of the course, the student will be able to understand how a cell can perform its vital functions to guarantee the homeostasis of the tissue to which it belongs thanks to its basic mechanisms. The student will be able to use this knowledge for the interpretation of the pathophysiological signs and symptoms, as a starting point for the study of the physiology of the individual systems subsequently treated in the vertical tracks.

Knowledge and Understanding By the end of the course, the student will be able to:

1. Describe the fundamental molecular, cellular, biochemical, and physiological mechanisms that maintain the body's homeostasis, and explain the human life cycle and the effects of growth, development, and aging on the individual, the family, and the community, with attention to sex/gender and population differences;
2. Demonstrate knowledge and understanding of the determinants of health and disease, such as lifestyle, genetic, demographic, environmental, socioeconomic, psychological, cultural, and sex/gender-related factors, including their relevance at the population level.

Judgment Autonomy By the end of the course, the student will be able to:

1. Demonstrate a critical approach, constructive skepticism, and a creative, research-oriented attitude, recognizing both the importance and limitations of scientific reasoning based on information gathered from multiple sources;
2. Formulate independent judgments to solve analytical and complex problems and independently search for scientific information, using the principles of evidence-based science without waiting for information to be provided;
3. Formulate hypotheses, and collect and critically evaluate data in order to solve problems.

Communication Skills By the end of the course, the student will be able to:

1. Listen attentively to extract and synthesize relevant information on a wide range of issues, fully

understanding their content;
2. Use a variety of scientific communication methods and tools, including written, verbal, and technological formats, considering their context and purpose; they will be able to identify the context in which specific information was created and disseminated, and critically evaluate the quality, credibility, reliability, and relevance of that information and its sources.

Learning Skills By the end of the course, the student will be able to:

1. Identify and critically evaluate information relevant to the practice of evidence-based medicine;
2. Critically assess their own level of education, recognize its limitations, and reflect on their learning and development needs;
3. Apply appropriate learning strategies to meet professional development goals, including goal-setting, planning, and time management for self-directed learning; make effective use of available resources to search for, identify, and select health-related information, and critically evaluate both content and sources.

Contents

The course is based on the systematic presentation of physiological concepts underlying the functions of the human body. The sequence of events leading to an imbalance of a specific function cannot be appreciated without a deep understanding of the basic biophysical and physiological mechanisms. Therefore, these mechanisms that guarantee functions at the cellular and tissue level will be presented. In particular, membrane transports, neuronal, muscular and cardiac cell excitability, the physiology of sensory systems, the motor control and muscle contraction will be analyzed.
During the course, the effects of the aging process and gender differences on human physiology will be emphasized.

Detailed program

Please, refer to the specific module

Prerequisites

Anatomy, biology, genetics and phisics

Teaching form

Lessons will take place in person. The professor's lectures begin with an initial part where concepts are presented (lecture-based mode), followed by an interaction with the students that shapes the subsequent part of the lecture (interactive mode).
Whenever possible, clinical case analyzes will be proposed for the evaluation of specific physiological parameters

Textbook and teaching resource

Please, refer to the specific module

Semester

First semester

Assessment method

There will be no ongoing tests.
The exam consists in a written test. Open questions will be posed to the student in order to evaluate the general knowledge of the topics. Moreover, the student will be asked to answer to questions that require the analysis of a complex phenomenon, its rationalization and the application of specific physiology principles and to solve simple exercises. Finally, a clinical case may be presented which will require the analysis of the interconnections between different physiological variables in the light of the theoretical paradigms.

Office hours

The professors receive by appointment upon agreement by e-mail
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Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY