UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Human Physiology

2627-1-I0108D004

Aims

1. Knowledge and understanding
   At the end of the course, the student will have acquired:
   -A solid foundation in general and medical physics, including an understanding of the theoretical principles underlying physical phenomena relevant to clinical and professional practice.
   -An in-depth knowledge of cellular and systemic physiological mechanisms, with particular attention to the functional integration of systems (cardiovascular, respiratory, renal, endocrine) and homeostasis maintenance.
   -The ability to describe and understand the molecular, biochemical, and biophysical bases of physiological functions and early signals of dysfunction.

2. Applying knowledge and understanding
   The student will be able to:
   -Critically and independently apply physical concepts to analyze, model, and solve problems, also in relation to technologies and clinical equipment.
   -Apply integrated models to interpret organ system functions in dynamic and real-life conditions.
   -Recognize initial functional alterations and compensatory mechanisms indicating the transition to pathophysiology.
   -Integrate concepts of experimental physiology with clinical and preclinical scenarios to understand parameter monitoring and procedures relevant to midwifery practice.

3. Making judgements
   The student will develop the ability to:
   -Formulate physiological and pathophysiological hypotheses based on evidence, interpreting both quantitative and qualitative data.
   -Critically evaluate the integration and consistency of information from different sources (biological, physical, clinical, environmental).
   -Make autonomous assessments of adaptive mechanisms and functional deviations that may precede pathological conditions.

4. Communication skills
   The student will be able to:
   -Clearly and accurately communicate topics related to medical physics and physiology, using appropriate technical terminology.
   -Present complex concepts using digital tools, graphs, and experimental data.
   -Actively participate in interdisciplinary discussions and effectively illustrate integrated functional models.

5. Learning skills
   The student will be able to:
   -Plan autonomous learning strategies to update and deepen their knowledge in physics and physiology.
   -Effectively consult scientific literature, databases, and digital resources to support lifelong learning.
   -Connect course content with related disciplines (e.g., pathology, pharmacology, radiology), recognizing personal learning needs and identifying the most relevant and up-to-date sources

Contents

Human Physiology course aims to give the student the concepts that govern integrated body functions in the living organisms. Emphasis is put on relationships between health and body homeostasis, from the cells to the organ systems. Thus, an attempt will be made to define the limit of physiological adaptation to environmental conditions or pregnancy, or to a developing disease. The course also aims to provide the basic principles of biophysics and medical physics needed to understand the biophysical mechanisms underlying the more relevant physiological processes.

Detailed program

For the detailed course content, please refer to the individual module syllabi

Prerequisites

Basic knowledge of Biology, Chemistry, Biochemistry, and Mathematics

Teaching form

Lectures; in particular, 30 hours of lecture-based teaching and 4 hours of interactive teaching

Textbook and teaching resource

Poltronieri Elementi di Fisiologia EdiSES

PHYSIOLOGY - Sherwood L. (2012) Fondamenti di Fisiologia Umana, Piccin-Nuova Libraria. Open choice by students among the Medicine Library's Physiology text books.

Semester

1 year - 2 Semester

Assessment method

For the Physiology module, the assessment will consist of a written examination comprising 18 multiple-choice questions and one open-ended question. Each multiple-choice question will include 5 answer options, only one of which is correct. The score for the multiple-choice section will be calculated based on the number of correct answers; no penalties will be applied for unanswered questions, whereas incorrect answers will be penalized. The open-ended question will be assessed based on the accuracy, completeness, and clarity of the response.
For the Medical Physics module, the assessment will consist of a written assignment to be completed at home, including open-ended questions and/or multiple-choice questions. This will be followed by an oral examination, during which the written assignment and all the topics covered during the lectures will be discussed.
As this is an integrated examination, the final grade will result from the integration of the assessments of the two modules, on the condition that a passing grade is achieved in both modules.

Office hours

Previous appointment

Sustainable Development Goals

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