UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Fisiologia

2425-1-I0102D004-I0102D014M

Aims

Expand knowledge of human physiology. There is an emphasis on integrating systems and whole body function, which makes this teaching methodologically very relevant in order to be skillful in midwifery professions.

Contents

A human physiology course for nurses and midwives covers a wide range of essential topics to understand the functioning of the human body and provide effective healthcare. The course begins with an introduction to physiology, the structure and function of human cells, and the principles of homeostasis. It delves into the neuronal cell, neurotransmitters, and autonomic regulation. It continues with the cardiovascular system, addressing the structure and function of the heart, blood circulation, and blood pressure regulation. The respiratory system is explored, including the mechanics of breathing and gas exchange. The urinary system is also analyzed, with particular attention to the kidneys and the regulation of fluid and electrolyte balance. The digestive system is covered through the structure of the gastrointestinal tract and the processes of digestion, absorption, and metabolism.

Detailed program

PHYSIOLOGY - Cellular physiology: homeostasis; the properties of the plasma membrane; transports (the diffusion, primary and secondary active transport); osmosis. Basic Electrophysiology: membrane potential; action potential; nerve impulse propagation; synapses. Muscle physiology: muscle contraction; electromechanical coupling; relationships between force-length and strength-speed into the muscles; types of motor-neuron units. Cardiovascular system: hemodynamic of circulation; systemic pressure and mechanical properties of blood vessels; adjustment of systolic and diastolic pressure; blood velocity; systemic and pulmonary circulation; the

venous system. The heart as a mechanic pump: mechanical work of the heart; cardiac output; self-regulation of cardiac output; regulation of heart rate and electrocardiography. Physiology of the interstitial tissue: exchange of liquid between capillaries and interstitium; the function of the lymph: the volume control of the interstitial fluid. Respiratory system: functional anatomy of the respiratory system; pulmonary ventilation; the ventilation-perfusion mismatch; mechanical properties of the lung and chest wall; the diffusion of gases: the alveolar-capillary units; hemoglobin saturation curve; gas transportation. The kidneys function: functional anatomy of the nephron; the mechanism of glomerular filtration; the renal clearance: filtration function, reabsorption and secretion; proximal tubular functions, Henle's loop functions; sodium and water balance. Digestive system: gastrointestinal motility; gastrointestinal secretions and digestion; absorption of food nutrients and dietary balance.

Prerequisites

Basic knowledge of 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

Written exam. A quiz with 33 questions will be proposed with 5 possible answers of which only one is the correct one

Office hours

Previous appointment (ilaria.rivolta@unimib.it)

Sustainable Development Goals

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