



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Physiology

2021-4-H4102D024-H4102D080M

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#### Aims

The course aims to provide the \_\_\_\_\_

#### Contents

cardiac physiology and adaptations (in health and disease); p\_\_\_\_\_

#### Detailed program

##### The heart

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- Structural and functional aspects of cardiac excitation-contraction coupling and its modulation (inotropy, lusitropy)
- The cardiac mechanical cycle (on pressure/time and pressure/volume planes) – definition of “systolic” and “diastolic” functions and their coupling.

- Cardiac “mechanical” and “chemical” work - relation to cardiac O<sub>2</sub> consumption (myocardial efficiency)
- Cardiac adaptation to preload and afterload changes in health and disease
- Principles of cardiac (systolic and diastolic) functional measurements (invasive and imaging)

### **The systemic circulation**

- Large arteries dynamics: windkessel mechanism, pressure pulse and its propagation
- Small arteries: regulation of peripheral resistance (intrinsic, neural, paracrine)
- Systemic pressure/flow relationship – peculiarities of the coronary circulation
- Determinants of capillary pressure – mechanisms of “edema”
- Mechanisms of venous return (preload maintenance and regulation)

### **The pulmonary circulation**

- Structure-function peculiarities
- Pulmonary vascular resistance : definition, regulation and measurement

### **Regulation of cardiovascular function**

- Pressure / volume homeostasis (neural and endocrine)
- Adaptation to physiologic demand (exercise, gravity, pregnancy etc)

## **Prerequisites**

- Fundamentals of human physiology module (by Profs. Sancini and Rivolta)
- English language

## **Teaching form**

- *During COVID-19 emergency period, the lectures will be held \_\_\_\_\_*
- All course activities will be held in English language

## **Textbook and teaching resource**

- Guyton and Hall Textbook of Medical Physiology 14 edition. Elsevier 2020, Chapters III (The Heart), IV (The Circulation) and VII (Respiration)

- Mohrman DE, Heller LJ. Cardiovascular Physiology 9th edition. McGraw Hill 2018

## **Semester**

- First semester

## **Assessment method**

Oral exam: \_\_\_\_\_

*In the event of pandemic emergency period, only telematic exams will be available. They will be carried out using the WebEx platform and on the e-learning page there will be displayed a public link where possible virtual spectators may get access and assist to the examination.*

## **Office hours**

By email appointment: \_\_\_\_\_

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