



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Fisiologia Umana 2 C

2627-2-H4103D007-H4103D00706

Aims

The practical module in Cardiovascular Physiology aims to provide students with the basic skills required to understand, measure and interpret key functional parameters of the cardiovascular system, with particular reference to arterial blood pressure and the physiological electrocardiogram.

By the end of the module, students are expected to understand the physiological principles regulating arterial pressure, peripheral vascular resistance, the sphygmocardi wave and cardiovascular control by the sympathetic nervous system and circulating catecholamines. Students are also expected to understand the meaning of systolic, diastolic and mean arterial pressure, to know the main methods for measuring arterial pressure, and to interpret a physiological electrocardiographic tracing by recognizing its main waves, intervals and segments.

Contents

The module focuses on the practical application of cardiovascular physiology principles through exercises on arterial pressure and the electrocardiogram. The physiological mechanisms underlying arterial pressure, the sphygmocardi wave, peripheral vascular resistance and sympathetic control of the cardiovascular system will be discussed. The distribution of pressure in the different districts of the cardiovascular system, the definition of systolic, diastolic and mean arterial pressure, and the methods used to measure arterial pressure will also be addressed.

The section dedicated to the electrocardiogram will focus on the reading and interpretation of a physiological ECG, with particular attention to the recognition of waves, intervals and segments, and to their relationship with the electrical events of the cardiac cycle.

Detailed program

The module introduces the main functional parameters of the cardiovascular system through a practical and applied approach. The first part will focus on arterial blood pressure, considered as a dynamic parameter resulting from the interaction among cardiac output, peripheral vascular resistance, the elastic properties of blood vessels and blood volume.

The concepts of systolic arterial pressure, diastolic arterial pressure and mean arterial pressure will be analysed, with reference to their physiological meaning and their relationship with cardiac and vascular function. The distribution of pressure in the different districts of the cardiovascular system will also be discussed, highlighting pressure changes along the arterial, capillary and venous circulation.

A specific section will be devoted to the sphygmoc wave, its origin and propagation along the arterial tree, and its significance as an expression of cardiac mechanical function and arterial elastic properties. The concept of peripheral vascular resistance will be examined, with reference to the role of arteriolar diameter, blood viscosity and regulation of vascular tone.

The mechanisms involved in arterial pressure control will then be addressed, with particular attention to the role of the sympathetic nervous system and circulating catecholamines. The effects of sympathetic stimulation on heart rate, myocardial contractility, vascular tone and peripheral resistance will be discussed, integrating these concepts with the physiological regulation of arterial pressure.

From a practical perspective, the main methods for measuring arterial pressure will be presented, with particular reference to indirect measurement using a sphygmomanometer. The principles underlying the assessment of systolic and diastolic pressure and the physiological meaning of the measured values will be described.

The second part of the module will focus on the electrocardiogram. The physiological principles underlying the generation of the electrocardiographic signal and its recording from the body surface will be reviewed. The meaning of the main waves, segments and intervals of the ECG tracing will be described, with reference to atrial depolarization, atrioventricular conduction, ventricular depolarization and ventricular repolarization.

The practical sessions will be aimed at guided reading and interpretation of a physiological electrocardiogram. Students will be guided in recognizing the P wave, QRS complex, T wave, PR interval, ST segment, QT interval and sinus rhythm. Particular attention will also be paid to the relationship between the ECG tracing, cardiac electrical events and the main phases of the cardiac cycle.

The module aims to integrate theoretical knowledge of cardiovascular physiology with the observation and interpretation of basic functional parameters, helping students develop a physiological understanding of arterial pressure and electrocardiographic data.

Prerequisites

The prerequisite requirements to be fulfilled in order to sit the Human Physiology exam are those indicated in the Teaching Regulations of the Medicine and Surgery degree programme for the 2026/2027 academic year.

Teaching form

The module will be delivered through practical sessions, intended as applied and interactive teaching activities aimed at consolidating theoretical knowledge and promoting its use in the interpretation of basic physiological

parameters.

Practical sessions allow students to engage directly with examples, tracings and measurements, developing observational, analytical and physiological reasoning skills. In particular, the activities will focus on the measurement and interpretation of arterial blood pressure and on the guided reading of the physiological electrocardiogram.

This teaching method promotes active learning, encourages student participation and supports the integration of theoretical principles of cardiovascular physiology with their practical application. Practical sessions also provide an opportunity to develop key transversal skills for medical training, including critical interpretation of data, the ability to connect physiological mechanisms with measurable parameters, and the acquisition of appropriate scientific language.

Textbook and teaching resource

Please refer to the general course syllabus.

Semester

Second year, second semester

Assessment method

Please refer to the general course syllabus.

Office hours

The professor receives by appointment upon agreement by e-mail
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Sustainable Development Goals

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