



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### Biochemistry II

1819-1-H4102D001-H4102D003M

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#### Aims

The Biochemistry II module aims to offer the training bases for a detailed molecular knowledge of medicine and modern technological applications to medicine.

The course is aimed at understanding the basic mechanisms responsible for alterations of homeostasis and the onset of diseases. In this way we want to lay the foundations for the molecular understanding of the complex phenomena of communication, interaction and control of cellular and tissue functions. The course also aims to make understanding, at a biochemical and molecular level, the complex communication phenomena between organs and the control systems of their functions and their interrelations in physiological conditions.

It will also be illustrated the possible different uses of different techniques, even with the use of practical common examples, with the aim of providing students the opportunity to learn to choose the best solutions to practical problems in clinical practice in the biochemical field

#### Contents

The Biochemistry II module will describe in detail the integrated biochemistry of organs and tissues. It will provide useful knowledge for the best understanding of other medical disciplines and clinics. The main mechanisms of biochemical regulation of the metabolism of blood, of the digestive system, cardiovascular, hepatic, of the nervous system, of the bone tissue will be illustrated. The hormonal and metabolic regulation of the metabolism and the conditions that can lead to their alteration will be described.

#### Detailed program

Blood glucose regulation in physiological conditions and in diabetes mellitus. Liver and systematic biochemical metabolism of the liver. Metabolism of ethanol taken with beverages. Metabolic detoxification of toxic compounds,

drugs and xenobiotics. Collagen metabolism and related diseases. Calcium regulation and mineral metabolism. Structure, composition, role and metabolism of the different classes of plasma lipoproteins. Metabolism of erythrocytes, blood coagulation, transport of oxygen in the blood. Aspects of human and metabolic sensory biochemistry. Hormonal regulation of metabolisms. Approaches based on nanomedicine in the therapeutic, diagnostic and regenerative fields. Nutritional aspects in physiological and pathological conditions. Technological aspects of the assay of different biochemical macromolecules involved in various metabolic processes.

## **Prerequisites**

Basic knowledge of biology and chemistry.

## **Teaching form**

Frontal lectures that require the active participation of students who will be involved in the subject by proposing group work, calculations and discussion of problems related to the change of body metabolism in conditions of illness, use of drugs, use of drugs, good and bad supply. Students will also be involved in actively participating in lectures bringing clinical cases to be discussed in the classroom.

## **Textbook and teaching resource**

Biocmemistry with clinical cases . T. Devlin

Biochemistry, Berg et al.

Come ci cureremo domani. La sfida della nanomedicina. M. Masserini

## **Semester**

Second semester.

## **Assessment method**

Written and oral exam: 15 multiple-choice questions (2 marks each) to be completed in 30 minutes.

The exam is positively evaluate with a score of 18/30 or higher. The final mark of module of Biochemistry will be the mean of Biochemistry I and II

Some questions may have more than one correct answer. Oral discussion of the written with possible deepening of one or more topics. The questions proposed in the written exam will be constructed in such a way as to induce the student to biochemical-clinical reasoning, to understand the units of measurement and to be able to evaluate the

skills and competences acquired according to the objectives of the course.

### **Office hours**

On appointment, all year-round

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