



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Scienze di Laboratorio

2627-2-I0302D008

Aims

Knowledge and understanding: students will acquire knowledge of the principles of laboratory diagnostics, the factors affecting the reliability of laboratory tests, calibration, validation and quality control procedures, the main diagnostic techniques (enzymatic and immunological), and the role of the principal clinical biochemistry investigations in the diagnosis and monitoring of the most common pathological conditions. In particular, students will acquire knowledge of haemostatic and coagulation processes, the related diagnostic methodologies, and the fundamentals of immunohaematology and transfusion medicine.

Applying knowledge and understanding: students will be able to operate laboratory instrumentation and perform the technical validation of analytical results. They will also be able to interpret the results of the main laboratory investigations, recognising their strengths and limitations, and apply the acquired knowledge to the assessment of different pathophysiological conditions, including metabolic, cardiovascular, endocrine, hepatic and renal disorders, as well as conditions related to haemostasis and immunohaematology.

Making judgements: students will be able to critically evaluate the appropriateness and reliability of laboratory tests, taking into account potential sources of variability and error and their impact on the clinical interpretation of results.****

Communication skills: students will be able to use the specialist terminology of Clinical Biochemistry correctly with regard to the technical procedures required for the proper performance of laboratory analyses and communicate the diagnostic significance of the main laboratory investigations.

Learning skills: students will be able to independently deepen and update their knowledge in the fields of laboratory medicine, biomarkers, diagnostic haematology, and diagnostic methodologies of clinical relevance.

Contents

The goal of the course is to provide the knowledge about roles, limits and aims of laboratory tests, Good Laboratory Practise, variability and errors, quality control. Fundamentals of protein study, diagnostic enzymology and immunometry. Lab tests for the study of common pathologies (e.g. diabetes). Haemostasis and fibrinolysis

physiopathology and related lab tests. Platelets, red blood cell pathologies, and their diagnostics. Transfusion medicine.

Detailed program

- Lab tests: which, how and when
- Good Laboratory Practice, variability and errors
- Instrument calibration, exam validation and Quality Control execution
- Exam interpretation, reference range, Reference Change Value, cutoffs
- Diagnostic enzymology and immunometry
- Diabetes, Obesity e Cardio-vascular risk monitoring
- AMI diagnostics
- Thyroid, plasmatic protein, electrolytes, acid-base balance study
- Kidney physio-pathology: creatinine and GFR
- Urine exam and proteinuria
- CSF tests
- Hepatic Diagnostics
- Pregnancy lab monitoring
- Tumor markers
- Haemostasis lab: pre-analytical, analytical features and related methods.
- Coagulation tests. TAO lab monitoring.
- ABO, Rh, and other systems and their lab study. Anti-erythrocytes antibodies and clinical meaning.
- Methods for blood group assessment and for the search of anti-erythrocytes antibodies. Physiopathology of Haemolytic disease of the newborn and of autoimmune anaemia.
- Blood components: preparation, storage and monitoring
- Transfusion medicine, adverse reactions and transfusion safeness.

Prerequisites

Teaching form

All activities are conducted in presence:

16 (2-hour) lectures performed in erogative mode;
12 (2-hour) exercises performed in erogative mode.

Textbook and teaching resource

Teachers will provide educational material
Spandrio L. Biochimica Clinica Ed Sorbona.
Henry JB, et al. Clinical diagnosis and management by laboratory methods. Saunders Elsevier.
Prencipe L. Approccio alla Chimica Clinica.

Semester

First semester

Assessment method

Written and oral exam.

- written test, aimed at evaluating candidate knowledge of the program of Diagnostic Hematology, consisting in 30 multiple choice questions. The score (or vote) will be the result of the right answers
- Oral interviews on the topics Laboratory Sciences, so as to assess the acquisition of knowledge related to the stages of the diagnostic process, the main techniques of clinical biochemistry analysis used in analytical laboratories, and the diagnostic strategies used to investigate the alterations in metabolic and organ processes most commonly evaluated by clinical biochemistry analysis. Each student is questioned individually, with a minimum of 4 questions, some of which are subject knowledge and others are reasoning questions.

The final assessment will take into account the results obtained in the different tests.

Office hours

By appointment
valerio.leoni@unimib.it
francesca.raimondo@unimib.it
federicamaria.vitarelli@asst-brianza.it
domenico.tripodi@asst-brianza.it

Sustainable Development Goals

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