UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Laboratory Sciences

2627-2-I0302D008-I0302D029M

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, as well as the main diagnostic techniques (enzymatic and immunological methods). They will also gain an understanding of the role of the principal biochemical-clinical investigations in the diagnosis and monitoring of the most common pathological conditions.
Applying knowledge and understanding: students will be able to operate technological equipment and perform technical validation of the results obtained. In addition, students will be able to interpret the results of key laboratory tests, recognizing their potential and limitations, and apply the knowledge gained to the assessment of various pathophysiological conditions, including metabolic, cardiovascular, endocrine, hepatic, and renal disorders.
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 correctly use the specialized terminology of Clinical Biochemistry, particularly with regard to the technical procedures required for the proper execution of laboratory analyses, and effectively communicate the diagnostic significance of the main laboratory investigations.
Learning skills: students will be able to independently expand and update their knowledge in the fields of laboratory medicine, biomarkers, and diagnostic methodologies of clinical relevance.

Contents

The goal of the course is to provide:

- knowledge about roles, limits and aims of laboratory tests, Good Laboratory Practise, variability and errors, quality control
- fundamentals of protein study and diagnostic enzymology and immunometry

- CSF and urine analysis
- lab tests for the study of diabetes, cardiovascular, thyroid pathologies, hepatic, pregnancy, kidney physio-pathology, hydro electrolytic and acid-base balance, tumor markers

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

Prerequisites

Objectives of the course of Clinical Biochemical Analysis (these are the courses indicated in Regolamento)

Teaching form

All activities are conducted in presence:

- 8 (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

Oral interviews on the topics covered in lecture. Examination topics cover the entire program covered in lecture, so as to assess understanding of the topics, with particular reference to 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.
Assessment will take into account how well the student centers the topic of the question, without dispersive digressions, how he/she contextualizes the topic, and the level of confidence in exposition.

Office hours

By appointment

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING