



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Diagnostic Technologies for The Biomedical Laboratory

2627-3-I0302D035

Aims

The course is made up of four modules (Therapeutic Drug Monitoring, Molecular Genetics, Biotechnological Diagnostics and Technical Sciences of Laboratory Medicine) in which the technological and application knowledge used in the different sectors of laboratory medicine related to the four areas will be provided.

DD1_ Expected learning outcomes in terms of:

1_ The course provides in-depth knowledge and understanding of biomedical laboratory diagnostic techniques, of the four areas of interest of the course, to address in a logical and comprehensive way regulatory and applicative aspects regarding:

- terminology: definition of the meaning of each figure of merit of the technologies and their estimation according to the regulations
- methodologies: highlight the critical aspects of current investigation procedures that can be improved through the innovations introduced by new knowledge.
- data analysis: awareness of the advantages and disadvantages of current data processing methodologies

DD2_ Through experiments and data analysis, the course allows students to apply the theoretical training acquired in practical contexts for biomedical laboratory investigations. In particular, the course allows students to:

- evaluate the possible realization of new analytical processes for the identification and quantification of biomolecules
- propose the optimization of existing analytical processes by introducing the novelties offered by new knowledge deriving from other sectors.
- evaluate the possible introduction of novelties deriving from new knowledge regarding advanced statistical tools

DD3_ The contents of the course imparted through frontal teaching and laboratory activities will allow students to develop critical thinking and therefore propose suggestions regarding experiments and data interpretation. In particular, students will be able to:

- evaluate and interpret experimental data obtained or derived from scientific literature;
- formulate scientific opinions on specific problems;
- formulate judgments that concern professional activities.

DD4_ The classroom and laboratory activities together with the exam allow to enhance the ability to effectively communicate complex scientific results, in written and oral form, both in academic and popular contexts. Students learn to present data deriving from biomedical laboratory diagnostic techniques to colleagues, experts and non-experts, in a clear and coherent way, using multimedia tools and scientific writing techniques.

DD5_ The teaching activities, the study of textbooks and scientific articles allow to:

- learn to work independently;
- collaborate in a team;
- understand texts regarding the technologies inherent to the course;
- deepen problems through specific bibliography;
- use the tools necessary for accessing and using scientific literature in English and databases;
- independently follow the development of technologies and their applications in the field of laboratory diagnostics
- select the available information and evaluate its reliability for the purpose of continuous updating of knowledge.

Contents

Scienze Tecniche di Medicina di Laboratorio: The primary goal of the course is to provide tools for the understanding of basic and practical aspect of chromatography and of spectroscopy for qualitative and quantitative analysis.

Therapeutic Drug Monitoring: The primary goal of the course is to provide tools for the understanding of the laboratory techniques to approach the field of Therapeutic drug monitoring.

Genetica Molecolare: Cytogenetics and particular genetic diseases. FISH, aCGH, imprinting diseases, triplet expansion diseases as examples of various techniques applicable in a genetics laboratory. Molecular Biology: PCR and its many applications, with examples related to a hemato-oncology laboratory

Diagnostica Biotecnologica: The primary goal of the course is to provide tools for the understanding of the laboratory techniques of clinical molecular diagnostics.

Detailed program

Scienze Tecniche di Medicina di Laboratorio: please consult the module syllabus

Therapeutic Drug Monitoring: please consult the module syllabus

Genetica Molecolare: please consult the module syllabus

Diagnostica Biotecnologica: please consult the module syllabus

Prerequisites

For Genetica Molecolare: Students should know the basic principles of Mendelian genetics, nucleic acid structure

and molecular biology.

Teaching form

Scienze Tecniche di Medicina di Laboratorio: please consult the module syllabus

Therapeutic Drug Monitoring: please consult the module syllabus

For Genetica Molecolare: please consult the module syllabus

Diagnostica Biotecnologica: please consult the module syllabus

Textbook and teaching resource

The Teachers will provide educational materials

Semester

First semester

Assessment method

see single course for details. The final exam consists of Discussion of the written test through an oral interview.

Office hours

On appointment requested by mail

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING
