UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Chemistry

2122-1-I0303D002-I0303D005M

Aims

The student should be able to:

•describe the fundamentals of atomic structure, types and significance of chemical bonds; indicate possible interactions between molecules

•explain the types of possible solutions and their concentration; define the concepts of osmolality and osmotic pressure the significance of osmotic phenomena in biological processes

•describe the different types of reactions that can occur between the compounds

•define the concept of acid, base and salt, pH and its meaning; describe the properties of the buffer systems.

•identify structural and chemical properties of the major classes of organic compounds and characteristics of the main reactions occurring in organic compounds.

•describe chemical characteristics of biological compounds: lipids, sugars, amino acids and nucleotides; describe composition and structure of nucleic acids and

proteins

Contents

The course aims to provide the student with: the knowledge of general and organic chemistry for the study of compounds in biological systems; the knowledge of the main metabolic pathways and biochemical cellular mechanisms; the knowledge of the structure and function of pro/eukaryotic cells, thanks to the tools provided by the integration of the most current and advanced concepts of molecular and cellular biology; the basis of formal

human genetics, introducing the student to the most basic laboratory techniques used for the diagnostic approach and research of hereditary disease

Detailed program

· The structure of matter. Chemical bonds.

· Solutions. Chemical reactions

· Acids, bases and buffers.

· Classification of organic compounds; functional groups which characterize the organic compounds.

· General properties of organic compounds and their reactivity.

· Organic compounds of biological interest: carbohydrates, amino acids, nucleotides, lipids. Polysaccharides. Proteins. Nucleic acids.

Prerequisites

Teaching form

Lectures, exercises

Textbook and teaching resource

M. Stefani, N. Taddei: Chimica Biochimica e Biologia Applicata Zanichelli.

R. Roberti, G. Alunni Bistocchi: Elementi di Chimica e Biochimica McGrawHil

Semester

First semester

Assessment method

Being an integrated course, the evaluation Will cover all four modules.

The evaluation will consist of a written test that will be used to ascertain the level of knowledge and ability to understand the topics covered during the course and to be able to solve problems. Therefore the student will have to answer:

Multiple choice test (10 quizzes concerning the topics of **Biochemistry**, 15 of **Biology**, 10 of **Chemistry** and 10 of

Medical Genetics)

Oral examination will be required at professor’s discretion (discussion of the written test). The oral test will serve to clarify critical issues emerged from the written test and to verify the communication skills of the student and will focus on the topics covered by the written test

Office hours

By appointment required by mail