

The Hebrew University of Jerusalem

Syllabus

GENERAL CHEMISTRY FOR BIOLOGY STUDENTS - 69174

Last update 01-12-2024

<u>HU Credits:</u> 6

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Chemistry

<u>Academic year:</u> 0

<u>Semester:</u> 1st Semester

<u>Teaching Languages:</u> Hebrew

<u>Campus:</u> E. Safra

Course/Module Coordinator: Prof. Roy Shenhar

<u>Coordinator Email: roys@huji.ac.il</u>

Coordinator Office Hours: By appointment

Teaching Staff:

Prof. Roy Shenhar, Ms. Bar Bader, Mr. Hadar Shema, Mr. Amir Reisinger

Course/Module description:

In this course we will introduce concepts from the world of matter, from the structure of the atom and the molecule, through chemical reactions and chemical equilibrium, to the behavior of materials. We will learn about the three main reactions that occur in aqueous/biological environments (i.e., acid-base, precipitation, and oxidation-reduction reactions), discuss the basic concepts of energy, and use them to explain natural phenomena as well as man-made (like batteries).

The course will provide not only information and concepts, but we will also develop the analysis skills that are used in the natural sciences.

<u>Course/Module aims:</u> See Learning Outcomes.

Learning outcomes - On successful completion of this module, students should be able to:

Classify materials into families Perform chemical calculations Distinguish between different reactions Analyze the possibilities of a certain material to undergo chemical reactions Explain the chemical nature of materials

<u>Attendance requirements(%):</u> 80%

Teaching arrangement and method of instruction: Lecture and exercise

Course/Module Content:

The electronic structure of the atom. Electronic configurations, the periodic table, and periodic properties. The chemical bond: Lewis diagrams, molecular geometry, hybridized orbitals, and molecular orbitals. Molecules and ions. Chemical formulas and chemical equations, stoichiometry. Chemical reactions in solutions, chemical equilibrium. Acids and bases, buffers, and titrations. Precipitation reactions and complex ions. Reduction and oxidation. Themochemistry and electrochemistry. Intermolecular interactions: van der Waals, hydrogen bonding, ionic interactions. State of matter, phase diagram and colligative properties.

<u>Required Reading:</u>

Certain chapters from the textbook according to the lecturer's request

Additional Reading Material:

General Chemistry, 11th edition; Hill, Herring, Madura, Bissonnette; Pearson, QD 31.2 P48 2017

Grading Scheme:

Written Exam % 80 Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 20 %

Additional information: