האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Introduction To Chemistry For Pharmacy - 69135

Last update 21-09-2024

HU Credits: 6

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Chemistry

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Dr. Zackaria Nairoukh

Coordinator Email: z.nairoukh@mail.huji.ac.il

Coordinator Office Hours: By appointment

Teaching Staff:

Dr. Zackaria Nairoukh,
Mr. Omer Agazani,
Ms. Nwar Agbaria,
Mr. Shahar Gadot

Course/Module description:

Chemistry introductory course covering the following topics:
Introduction to chemistry, atomic structure, periodic table and periodic properties, chemical bond, molecular structure, chemical equilibrium, acid base, thermochemistry, electrochemistry and gas laws.

Course/Module aims:

Providing background and basic concepts and tools required for advance chemistry courses for pharmacy students.

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

Solve problems that require understanding and knowledge of the topics covered by the course.
Specifically, on successful completion of this module students should be able to:
Explain atomic theory and use the electronic structure of atoms to explain the line spectra of elements and predict the geometry and polarity of covalent molecules
Derive the molecular formulas of substances and use the periodic table to predict the chemical and physical properties of elements and chemical compounds
Apply the ideal gas laws and qualitatively describe the differences between solids, liquids, and gases at a molecular level.
Apply basic thermodynamic concepts to chemical processes and chemical equilibria.
Describe solutions, solubility of substances, and colligative properties.
Define acidity and basicity and calculate the pH of solutions of strong and weak acids or bases and account for the behaviour of buffer solutions.

Attendance requirements(%):

None

Teaching arrangement and method of instruction: Lecture and Exercise

Course/Module Content:

Syllabus:

1. Chemical Foundations - the scientific method, the early history of chemistry, fundamental chemical laws, Dalton's atomic theory, introduction to the periodic table, nomenclature, stoichiometry, the mole, atomic masses, balancing chemical reactions, types of chemical reactions: precipitation reactions, acid-base reactions, oxidation-reduction reactions.
2. The atomic structure and the chemical bond - electromagnetic radiation, the atomic spectrum of hydrogen, Bohr's model, the Aufbau principle, electronegativity, dipole moment and the formation of the ionic bond, lattice enthalpy.
3. The chemical bond - the covalent bond, the valence bond theory, the octet rule, VSEPR, molecular structure, hybridization, molecular orbitals of diatomic molecules, inter vs. intra molecular forces and bonds.
4. Stoichiometry, mole, chemical equation, yield, concentration etc.
5. Reactions in solutions, acid-base, precipitation reactions, titrations.
6. Chemical equilibrium - the equilibrium constants, heterogeneous equilibrium, solving equilibrium problems, Le Chatelier principle, equilibrium in acid-base, precipitation reactions, the Nernst equation. Strong and week acids and bases, buffers.
7. Oxidation-reduction processes, oxidations state, half cell reactions, balance.
8. Thermochemistry - energy, enthalpy, state functions, Hess law, calorimetry, free energy and entropy.
9. Electrochemistry, electrode potential, nernst equation.

Required Reading:
PPT will be uploaded in the course website. Exercises and solutions will be provided weekly. No compulsory book, any textbook in General Chemistry in English will fit.

Additional Reading Material:

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

Additional information: