

**Name of the module: Chemistry 1<sup>st</sup> year Medicine**

**Number of module: 471-8-1002**

BGU Credits: 4

ECTS credits:

Academic year: 1<sup>st</sup> year Medicine

Semester: first semester

Hours of instruction: 14:15-16:00, 8:00-10:00

Location of instruction: Daily lectures will take place in the Deichmann Building for Health Professions. Specific classroom numbers are indicated in the schedule.

Language of instruction: Lectures will be given in Hebrew.

Cycle: B.Med.Sc

Position: Obligatory module intended for 1<sup>st</sup> year medical students, as part of their preclinical teaching.

Field of Education: Chemistry

Responsible department: The Shraga Segal Department of Microbiology, Immunology and Genetics

General prerequisites: N/A

Grading scale: Successful passing of the exam with a score of 65 or higher.

Course Description: This course provides a comprehensive study of the chemical principles.

Aims of the module: The goal of the Chemistry module is to introduce and teach basic principles and practice in General, Analytical, and Physical Chemistry.

Objectives of the module: Each student will (1) develop a conceptual understanding of the basic principles of chemistry in biology and modern medicine; (2) understand the modern medical applications of chemistry in use at hospitals; and (3) develop a flexible, logical problem solving methodology applicable, not only to this course, but to the greater academic and career challenges ahead.

Learning outcomes of the module: On successful completion of the course, the student should be able to:

1. Develop basic understanding of chemistry concepts
2. Develop problem-solving and critical-thinking skills
3. Learn to integrate and apply various chemical concepts to real-life medical and biological problems

Attendance regulation: Attendance of the lectures is encouraged, attendance of the exercises is obligatory.

Teaching arrangement and method of instruction: Instruction in the module is based on frontal oral lectures for the whole class and exercises in groups.

Lecturer: Dr. Alex Braiman

Contact details:

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Office hours: By appointment

Module evaluation: at the end of the semester the students will evaluate the module, in order to draw conclusions, and for the university internal needs.

Confirmation: the syllabus was confirmed by the faculty academic advisory committee to be valid on 2012 (academic year)

Last update: 10/2015

Assessment:

Students will be assessed in the module only by passing a final exam with a score of 65 or higher.

Work and assignments: Reading the relevant text book chapters and solving homework problems as a prerequisite for the final test admission.

Time required for individual work: in addition to attendance in class, the students are expected to do their assignments and individual work: solving problems and read the relevant text book chapters. Due to the method of the module – students are required to study and review the lectures at home. Roughly 30 minutes per an hour lecture. Problem solving learning and preparation will take 4hr.

Module Content\ schedule and outlines:

- Introduction to the world of chemistry
- Basic concepts - matter, energy, measurements
- Physical and chemical changes and properties
- Atomic theory and subatomic particles
- Radioactivity and Nuclear Chemistry
- The periodic table of elements
- Molecules, Compounds, and Chemical Equations
- Formulas and Names
- Chemical bond theories
- Molecular geometry and its effects on substance properties
- Intermolecular forces
- Types of chemical reactions
- Stoichiometry
- Redox reactions and redox potentials
- Chemical Equilibrium, Le Châtelier's Principle
- Solutions and aqueous equilibrium
- Colligative properties, osmosis
- Acids and bases
- Buffers and titration
- Solubility equilibrium and the solubility product constant
- Principles of Chemical Kinetics – The rate law, reaction mechanism, catalysis
- Principles of chemical thermodynamics
- Energy, Heat, Work
- Thermochemistry
- Entropy and the Second Law of Thermodynamics
- Free energy and equilibrium

Required reading: **Chemistry** by Steven S. Zumdahl and Susan L. Zumdahl (6<sup>th</sup> edition or later)

Additional literature: Every fundamental university General Chemistry textbook

**\* All learning material will be available to the students on the module's website Moodle/ library/ electronic documents available to BGU students.**









