האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Physical Chemistry for Medicine - 96108

Last update 24-01-2024

HU Credits: *2.5*

Degree/Cycle: *1st degree (Bachelor)*

Responsible Department: *Medicine*

Academic year: *0*

Semester: *1st Semester*

Teaching Languages: *Hebrew*

Campus: *E. Safra Ein Karem*

Course/Module Coordinator: *Dr. Assaf Zemel*

Coordinator Email: *assaf.zemel@ekmd.huji.ac.il*

Coordinator Office Hours: *Mondays, at 13:00-14:00*

Teaching Staff:

Dr. Assaf Zemel,
Mr. Ofer Burg,
Ms. Einav Scharf

Course/Module description:

The course provides an introduction to the principles and applications of equilibrium thermodynamics. The first part of the course will introduce the fundamental laws of thermodynamics and few important applications of thermodynamics will then be studied. Concepts such as work, heat, internal energy, enthalpy, entropy, free energy and the chemical potential will be taught and used in the study of chemical equilibrium, phase behavior, and the Nernst equilibrium.

Course/Module aims:

To introduce the students to the fundamentals of thermodynamics and its applications.

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

understand the first and second laws of thermodynamics; understand the differences between work, heat and internal energy; understand the concept of enthalpy, entropy, free energy and chemical potential. Calculate differences in thermodynamic variables for defined processes. Understand what determines the state of equilibrium in a chemical reaction, between different material phases, of ions across a membrane. Will understand the origin of membrane potential.

This course supports the following HUHSDM Professional Practice Competencies: 1.2

Attendance requirements(%):

80%

Teaching arrangement and method of instruction: Frontal lectures

Course/Module Content:

5/2/2023 Introduction to physical chemistry and thermodynamics. Dr. Zemel.
6/2/2023 The first law of thermodynamics. Dr. Zemel.
8/2/2023 The Heat of a chemical reaction, enthalpy and thermochemistry. Dr. Zemel.
12/2/2023 Thermodynamic cycles, introduction to the second law of thermodynamics. Dr. Zemel.

13/2/2023 The second law of thermodynamics. The Gibbs free energy. Dr. Zemel.
15/2/2023 The chemical potential. Dr. Zemel.
20/2/2023 Chemical equilibrium, membrane potential and the Nernst equation. Dr. Zemel.

Required Reading:
N/A

Additional Reading Material:
Physical Chemistry by Peter Atkins.

Grading Scheme:
Written / Oral / Practical Exam 100 %

Additional information: