

The Hebrew University of Jerusalem

Syllabus

Fundamentals of Analytical Chemistry - 64101

Last update 05-11-2017

HU Credits: 2

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: school of pharmacy

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: Ein Karem

Course/Module Coordinator: Dr. Rachel Ta-Shma

Coordinator Email: rachelt@ekmd.huji.ac.il

Coordinator Office Hours:

Teaching Staff:

Dr. Rachel Ta-Shma

Course/Module description:

The course provides basic theoretical background to quantitative analytical methods accepted in chemical and pharmaceutical laboratories.

Course/Module aims:

See learning Outcomes

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

At the end of this course;

The students will understand the principles of analytical methods used in main quantitative determination.

The students will be able to analyze the results in the lab and the possible error sources.

The students will be able to choose a good analytical method for a given compound.

Attendance requirements(%):

100

Teaching arrangement and method of instruction: Lecture and exercise

Course/Module Content:

List of topics:

1. Refreshing mathematical skills and some statistics: Scientific notation, value and units, units, systematic errors and random errors, normal error curve, average and standard deviation, the accumulation of errors, finding the best linear dependence between two variables and the correlation coefficient.

2. Different concentration units and dilution; molarity, molality, volume and weight percentage, ppm and ppb.

3. Acids and bases: Bronsted acids and bases, equilibrium constants of acids and bases, acids and bases in nonaqueous solvents, the ionization of water, pH, ionic strength and activity, indicators, neutralization, buffers.

4. Titrations of acids and bases: Basic terms in volumetric analysis, types of titration, standards, calculation of titration curves for strong and weak acids and bases and for polyprotic acids, equivalent concentrations and the normal.

5. Solubility of insoluble salts and product of solubility, precipitation titrations,

EDTA complexes with metals.

6. Redox: Oxidising and reducing reagents, balancing redox processes, redox titrations, equivalent concentration in redox reactions, introduction to electrochemical cells (electrolytic and Galvanic), glass electrode and pH measurement.

7. Introduction to spectroscopy: Absorption spectroscopy in UV, Beer-Lambert law and deviations from this rule.

8. Introduction to chromatography: Principles of separation by partition, liquid chromatography LC and TLC.

Required Reading:
course presentations

Additional Reading Material:
D.C. Harris
Quantitative Chemical
Analysis
any edition

Course/Module evaluation:

End of year written/oral examination 90 %

Presentation 0 %

Participation in Tutorials 0 %

Project work 0 %

Assignments 10 %

Reports 0 %

Research project 0 %

Quizzes 0 %

Other 0 %

Additional information: