האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

GENERAL CHEMISTRY LAB FOR THE PHYS. SCIE. PROG. - 69102

Last update 25-03-2025

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Chemistry

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Prof. Shlomo Yitzchaik

Coordinator Email: zeev@mail.huji.ac.il

Coordinator Office Hours: By appointment

Teaching Staff:
Prof. Shlomo Yitzchaik,
Mr. Hadar Shema,
Mr. Sagi Ezov

Course/Module description:
This is the first laboratory course in chemistry for the "exact sciences" students. As such, the general aim of this laboratory is to introduce the student into some of the important experimental principles and methodologies used commonly in chemistry.

The course is based on the "General chemistry lab" course (69115), including a few additional experiments from "analytical and general chemistry lab" (69117).

The course includes:
Basic training in the chemical laboratory - main terms, correct and safe working, instrumentation, etc.

Performing a set of experiments described below and learning basic lab operation and performance.

Course/Module aims:
The main goals of the lab are to acquire basic chemical lab working skills, and to perform basic experiments in general and analytical chemistry.
The students will be introduced to basic methodologies and experimental techniques used commonly in general and analytical chemistry.

Learning outcomes - On successful completion of this module, students should be able to:
1. Gain "hands-on" experience in lab work - preparation, conducting and summarizing experiments.

2. Deepen understanding and knowledge in specific subjects in general chemistry.

3. Prepare for specific experiments in general and analytical chemistry.

4. Perform independently (but guided) basic experiments in analytical chemistry.

5. Report the experimental results of an experiment, including error analysis.

6. Analyze and criticize the final results obtained in a simple experiment.

Attendance requirements(%):
100%

Teaching arrangement and method of instruction: Laboratory.
As follows:
1. Quiz - 20 min. quiz in the beginning of every lab.
2. Lecture - by the guide, not longer than 20 min.
3. Experiment - individual work is preferred.
4. Lab reports - written and handed-in according to course procedures.

Course/Module Content:
Safety.

Familiarization with the chemical laboratory, key terms, and instillation of correct and safe working habits.

Lab experiments in:
1. Copper cycle
2. Acids-bases
3. Buffers
4. Electrochemistry
5. Potentiometry and Conductance
6. Calorimetry
7. Fluoride determination
8. Gas laws.
9. Atomic absorption
10. VIS absorption and Mn/Cr determination
11. Chromatography (HPLC).

(Experiments 9-11 - additional from the analytical chemistry lab).

Computerized data analysis and experimental error estimation & calculation methods.

Required Reading:
As presented in the course page for each experiment.

Additional Reading Material:
Most of the theoretical background can be found in the following books:

1.Hill J.W.,Petrucci, R.H. General Chemistry, 2th ed.

2. Petrucci, R.H. General Chemistry.-8th ed.
3. Zumdahl, Steven S., Chemistry. 4th ed.
4.Harris D.C. Quantitative Chemical Analysis.-5th ed.
5.Skoog D.A., West D.M., Holler F.J. Fundamentals of Analytical Chemistry.-7th ed.
6.Vogel A.I. Textbook of quantitative chemical analysis.-5th ed.
1.Hill J.W.,Petrucci, R.H. General Chemistry, 2th ed.
2. Petrucci, R.H. General Chemistry.-8th ed.
3. Zumdahl, Steven S., Chemistry. 4th ed.
4.Harris D.C. Quantitative Chemical Analysis.-5th ed.
5.Skoog D.A., West D.M., Holler F.J. Fundamentals of Analytical Chemistry.-7th ed.
6.Vogel A.I. Textbook of quantitative chemical analysis.-5th ed.

Grading Scheme:
Oral Exam % 20
Active Participation / Team Assignment 10 %
Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 50 %
Clinical Work / Lab Work / Practical Work / Workshops 10 %
Personal Guide / Tutor / Team Evaluation 10 %

Additional information:
Course website - Moodle.

11 laboratory sessions will be conducted during the semester, and the final grade is an average of the 11 meetings. A missed experiment equal to a grade of zero, without an option to be conducted on a different day.

Grade is composed of:
30% quizzes before the lab
30% participation in colloquia and work in lab
40% lab reports