האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

GENERAL CHEMISTRY LAB FOR BIOLOGY AND ENVIRONMENTAL STUDIES STUDENTS - 69173

Last update 09-02-2021

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Chemistry

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Prof. Gil Shoham

Coordinator Email: gil2@vms.huji.ac.il

Coordinator Office Hours: By appointment

Teaching Staff:
Prof Gil Shoham,
Ms. Hadar Yakir,
Prof Meital Reches,
Ms. Mazal Kosten,
Ms. Orly Abarbanel,
Ms. Noa Mandiel

Course/Module description:
This is usually the first laboratory course in chemistry for "non-chemistry" students and often the first experimental laboratory of many of the participating students. As such, the general aim of this laboratory is to introduce a non-chemist, life-sciences student, into some of the important experimental principles and methodologies used commonly in chemistry and biochemistry. The lab includes 2 well-guided introductory experiments in general chemistry (acid-base titrations and oxidation-reduction cycle of copper) and 6 more advanced experiments in biochemically-oriented analytical chemistry, each introduces a specific experimental methodology, including volumetric titrimetry, complexometry (with EDTA), argentometry (Ag-halides), iodometry (vitamin C), spectroscopy (indicators and complex structure), atomic absorption spectroscopy (AA) and high-pressure liquid chromatography (HPLC). In each of these experiments the student is required to write a pre-lab report, to summarize his lab preparation, and a final report, to summarize his experimental performance and results. An emphasis is given to the background reading, the proper preparation for each experiment, the clear presentation of the experimental procedures and the meaningful analysis of the final results.

Course/Module aims:
The main aims of this laboratory are as follows:
1. To introduce the student into the main methodologies and experimental techniques used commonly in general and analytical chemistry.
2. To train the student to conduct an independent experiment, including the background reading, experiment execution, experimental report and experimental error evaluation.
3. To develop independent working and thinking skills for general scientific experiments.

Learning outcomes - On successful completion of this module, students should be able to:
1. Prepare for specific scientific experiments based on experimental guidelines.
2. Perform independently basic experiments in analytical chemistry.
3. Report the experimental results of an experiment, including error analysis.

4. Analyze and report the final results obtained in a simple scientific experiment.

Attendance requirements(%):
100%

Teaching arrangement and method of instruction: Laboratory.
The students are divided to small sections of 6-8 students. Each section is guided and instructed by a dedicated Teaching Fellow (TF). Each of the lab experiments start with a 20 min exam on the relevant material, followed by a 20 min discussion of the students with the TF. The experiment takes usually around 3 hours, leaving about 20 min to summary and preparation for the next experiment. The course is designed and managed by a senior academic teacher, which determines the specific course program and schedule, conducts introductory presentations to the whole class and instructs the TFs for the specific experiments and the general course guidelines. Teacher-TF instructional meetings are conducted on a weekly basis, together with the relevant lab technicians.

Course/Module Content:
The course includes 8 different experiments, each dedicated to a specific subject and/or methodology in chemistry. These experiments cover acid-base neutralization titrations, oxidation-reduction reactions of copper, determination of Vitamin-C by iodometric techniques, complexometric analysis of calcium and magnesium with EDTA, halide concentration determination by argentometric (Ag) techniques, spectroscopy of acid-base indicators and iron complexes, atomic absorption spectroscopic analysis of cations in drinking water, gravimetric analysis of barium and nickel and high-pressure liquid chromatography (HPLC) analysis of caffeine in hot and soft drinks.

Required Reading:
The general instructions for each of the experiments are available in the laboratory booklet of the course. Further reading is required from a list of Textbooks, with specific page indications in the experiment description in the booklet. The textbooks and reading assignments change according to the specific experiment and the relevant methodology involved.

Additional Reading Material:

Course/Module evaluation:

End of year written/oral examination 0 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 100 %
See Below: Extra Informaion

Additional information:

** The final grade of the course is based on the individual grades of each of the 8 experiments conducted. Each of the experiments is graded separately on the basis of "preparation" (40%), "performance" (30%) and "reports" (30%).*

*** During the academic school year, Prof. Shoham will also be available at the Student Labs, Brandman Building, Room 202, usually during the lab afternoons 14:00 - 16:00.*