האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

# *The Hebrew University of Jerusalem*

## *Syllabus*

# *ANALYTICAL AND GENERAL CHEMISTRY LAB - 69117*

*Last update 18-11-2018*

*HU Credits:* *8*

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

*Responsible Department:* *Chemistry*

*Academic year:* *0*

*Semester:* *1st 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. Noam Hadad*
*Ms. Hadar Yakir*
*Ms. Reem Ghadir*
*Prof Zeev Aizenshtat*

*Course/Module description:*

*This is usually the second laboratory course for chemistry students (after a basic introductory laboratory), which intends to extend their knowledge and lab techniques in general and analytical chemistry.*
*The general aim of this laboratory is to introduce the student into the main methodologies and experimental techniques used commonly in general and analytical chemistry. The lab includes 9-12 "regular" guided experiments, 2 "special" experiments and a "final project". Each of the guided regular experiments introduces a specific experimental methodology and/or a specific technique, including volumetric titrimetry, gravimetry, complexometry, argentometry, iodometry, spectroscopy, atomic spectroscopy (AA), gas chromatography (GC) and high-pressure liquid chromatography (HPLC).*
*Once the student learned and practiced these specific methodologies, he is required to perform, individually and with minimal guidance, two special experiments, where these methodologies and techniques should be combined and integrated.*
*The last part of the lab is a full individual project that takes about 8 lab meetings, in which the student is required to use and implement all the methodologies and techniques learned in the first part of the lab course. In this project, each student is challenged with the qualitative and quantitative determination of a (different) unknown solution containing a mixture of 4-5 different inorganic components, where he is also required to report and present (in front of the class) the strategy selected, the experiments performed and the final results obtained.*

*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 prepare and conduct independent experiment, including the background reading, the design of the experiment, experiment execution and experimental report.*
*3. To develop independent working and thinking skills in experimental chemistry.*

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

*1. Prepare for specific experiments in general and analytical chemistry.*
*2. Perform independently basic experiments in analytical chemistry.*

*3. Design experimental strategy for the analytical determination of cations.*
*4. Report the experimental results of an experiment, including error analysis.*
*5. Analyze and criticize the final results obtained in a simple 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). The standard 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 special experiments and the final project are carried in a different way, leaving the preparation and experimental design to the student, with minimal TF guidance. 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 methodology-specific experiments covering the following subjects: standard solutions, EDTA, indicators, volumetric titrimetry, gravimetry, complexometry, argentometry, iodometry, spectroscopy, atomic spectroscopy (AA), gas chromatography (GC) and high-pressure liquid chromatography (HPLC). The special experiments and the final project are based on the use of these methodologies and their student-designed combination for task-specific purposes.*

*Required Reading:*
*The general instructions for each of the experiments are available in the Moodle site of the course. Further reading is required from a list of Textbooks, with specific page indications in the Moodle site. 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 its parts. The relatives weights of the various parts involved are: 1 for "regular" experiments, 2 for "special" experiments and 6-8 for the final project. Each of the experiments is graded 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.*