

Philadelphia University Faculty of Science

Department of Basic Science and Mathematics

First Semester, (2018/2019)

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|  | **Course syllabus** | |  |
| **Course Title:Aanalytical Chemistry**  **Laboratory** | | **Course code:0212242** | |
| **Course level: 2ndYear** | | **Course prerequisite (s) and/or corequisite (s):0212241** | |
| **Lecturetime:**  **Sun (13:10-16:00), Mon (13:10-16:00)** | | **Credit hours:1** | |
| **Contact hours:** | |
| **Location: Green House** | |  | |

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|  | | **Academic Staff**  **Specifics** |  | |
| **Name** | **Rank** | **Office number and**  **location** | **Office**  **hours** | **E-mail address** |
| **Tamara mfarej** | **lecturer** | Science / 1016 | **9-10**  **Sun** | [**tmfarej@philadelphia.edu.j**](mailto:tmfarej@philadelphia.edu.j)**o** |

Course description

This course is an introduction to principles of analytical qualitative and quantitative analysis, methods expressing of the concentrations, principles of volumetric analysis, acid-base Equilibria in aqueous and in nonaqueous solutions, acid-base titration and their applications in both solutions. Also topics to be covered include different kinds of titrations such as redox, and precipitation titration, in addition, it examines some basic chromatographic separation techniques and spectrophotometric analysis.

Course module objectives :

Develop the statistical and analytical skills of the students.

Prepare the students to distinguish between qualitative and quantitative analysis. Provide a practical experience in the use of routine analytical equipment.

Prepare students to quantitatively perform and interpret results from volumetric and gravimetric analysis.

Improve the student's skills in the preparation of analytical solutions for quantitative analysis.

Improve the written communication skills of students, by means of written reports and promote team skills through team group working.

Course/ module components Analytical Chemistry manual.

Chem 332L Experimental Analytical Chemistry Fall 2010 manual.

Teaching methods :

Lectures, practical work, discussion groups, tutorials, problem solving, debates, etc.

Learning outcomes : Knowledge and understanding

At the end of this module, student will be able to:

prepare analytical solutions with precision, accuracy and express its concentration in different units, as used in analytical laboratory.

Explain standardization procedures employed in volumetric analysis. Communicate the analytical results in appropriate fashion.

Cognitive skills (thinking and analysis.)

Through this practical course the students will be able to analyze the data they obtained, understanding the results and apply the techniques they have learned into different aspects.

Communication skills (personal and academic.)

Through team work, pre and post laboratory questions, and working sheets the students will be able to improve their communication skills through searching and discussing.

Practical and subject specific skills (Transferable Skills.)

All the techniques that the students have been learned during this practical course, can be used and applied in other courses, in their graduation projects, and also their practical working field.

* **Laboratory Handbook/ books (when applicable)**

Analytical chemistry (an introduction) by Skoog /West /Holler (Editors) 7th edition (1999),Saunders Golden SunBurst series,ISBN;0-03-022930.

.2Chem 332L Experimental Analytical Chemistry Fall 2010 manual.

Teaching methods(Lectures, discussion groups, tutorials, problem solving, debates, etc)

Working groups, each group consist of two studesnts, they must work together the practical work, answer the report and working sheets.

Learning outcomes:

Knowledge and understanding

At the end of this module, student will be able to:

The general procedures for conducting various elementary qualitative and quantitative experiments.

How to collect and organize experimental data. The identity of typical chemistry equipment.

The procedures for operating common laboratory equipment.

The importance of safety precautions that should be practiced in the laboratory.

Assessment instruments

Quizzes

Major and final exams Home works

Reports

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| **Allocation of Marks** | |
| **Assessment Instruments** | **Mark** |
| Mid Term examination | **30** |
| Final examination | **40** |
| Reports, quizzes, | **30** |
| Total | **100** |

Evaluation:

Evaluation will occur through the administration of assessment modes including: weekly quizzes, assessing overall preparation, midterm and final exams. Evaluation modes include the graded laboratory notebook, reports and technique performance. Technique performance includes assessment of safety practice.

Course/ academic calendar

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| **week** |  |  |
| **(1)** | **Calibration of Volumetric Glassware** | **Solving working sheets and reports** |
| **(2)** | **Sampling and statistical treatment of data** | **Solving working sheets and reports** |
| **(3)** | **Neutralization titration in aqueous medium** | **Solving working sheets and reports** |
| **(4)** | **Preparation of buffer solution** | **Solving working sheets**  **and reports** |
| **(5)** | **Precipitation titration (Argentometric)** | **Solving working sheets and reports** |
| **(6)** | **Midterm examination** |  |
| **(7)** | **Redox titration (Iodine Titration)** | **Solving working sheets** |
| **(8)** | **Redox titration(permangate titration)** | **Solving working sheets and reports** |
| **(9)** | **Complex metric titration using EDTA** | **Solving working sheets** |
| **(10)** | **Quantitative Analysis by spectroscopy** | **Solving working sheets**  **and reports** |
| **(11)** | **Chromatography (Column ,Size Exclusion)** | **Solving working sheets and reports** |

Expected workload:

On average students need to spend 3hours of study and preparation for each lab. Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.