

ANALYTICAL CHEMISTRY

Course code: NP18-03

Cycle / Level of studies: Undergraduate
Semester: 1st
Course type: Background / General Knowledge
Scientific area: Pharmaceutics
Credits (ECTS): 6
Theory (hours): 3
Tutorial (hours): -
Workshop (hours): 1,5

INSTRUCTORS

Course coordinator:
Aristidis Anthemidis, Professor
Instructors:

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- 5) George Tsogkas, Assistant Professor
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Auxiliary staff: -

Cognitive objectives:

Understanding, on the part of students, the basic principles of Analytical Chemistry and the available methods of chemical analysis that find application in pharmaceutical analysis. Understanding of basic concepts such as sampling, sample, analytical process, analyte, analytical instruments, result and ways of expressing its accuracy.

Skills:

Become familiar with basic concepts of Analytical Chemistry and learning methods of wet-chemical analysis.

Teaching methods:

Lectures and laboratory exercises.

Course content:

Solutions - Chemical Equilibrium
-Solutions and solubility of substances.
-Balances of weak acids and bases
-Hydrolysis of salts, buffers
Heterogeneous chemical equilibrium, Product of solubility
Introduction to Quantitative Chemical Analysis
Classification of chemical analysis methods. Bibliography of Analytical Chemistry.
Units and ways of expressing solution concentration.
Errors.
Basic statistical parameters describing results.
Estimation statistics.
Performance of analytical methods.

Reagents and materials used in chemical analysis.
Sampling. Physical and chemical processes for mass and volume measurement.
Basic principles of wet digestion, fusion and dry ashing of samples and other sample treatment procedures for chemical analysis.
Quantitative Chemical Analysis Methods
Principles of titration analysis
Titration of acids and bases
Various applications of acid-based titrations in pharmaceutical analysis.
Precipitation and complex titration measurements and applications.
Applications of redox and potentiometric titrations.

Suggested reading:

1. Quantitative Chemical Analysis by A. Anthemidis, A.N Voulgaropoulos, G. Zachariadis and I. Stratis, ZITI PUBLICATIONS, ISBN 978-960-456-292-3
2. Analytical Chemistry, Gary Christian, P. DasGupta, K. Schug, 7th Edition (ΑΝΑΛΥΤΙΚΗ ΧΗΜΕΙΑ, 1η Greek Edition, Odysseus Publishing) ISBN: 978-9925-7467-4-3.
3. Quantitative Analytical Chemistry, Harris C. Daniel, Lucy A. Charles (Greek translation: ISBN: 9789925576111 Publisher: BROKEN HILL PUBLISHERS LTD
4. Fundamentals of Analytical Chemistry, D.Skoog, D. West, F. Hollas, S. Crouch, Ed. Brooks Cole, USA

Learning activities:

Attending lectures and performing experimental exercises.

Evaluation methods and process:

Written examination at the end of the semester.

The assessment process is usually based on 5 topics which consist of 2 sub-topics where students are asked to analyze and answer. All subjects are equivalent and each subject receives 1.0 point. Exam time is 2 hours.

The right to participate in the exams have the students of the 1st semester who have successfully completed the laboratory exercises and participate in the attendance of the course.

The exams at the end of the semester take place on the dates and places announced by the Department.

Use of ICT / Online course availability:

The lectures of the course are made using ICT (Powerpoint presentation, interactive tutorial exercises using computer, video, etc.).

Teaching (Lectures / Workshops / Tutoring)

The teaching of the course takes place with lectures take place twice a week (two hours and one hour) in the amphitheater of the New building of the Department of Chemistry and electronic means are used to display the lectures.

The laboratory exercises take place on the 4th and 5th floor of the New building once a week for each group of students (three hours).

Students are required to participate and present written results of their analyses for evaluation.