
COURSE: ANALYTICAL CHEMISTRY

ACADEMIC YEAR: 2017-2018

TYPE OF EDUCATIONAL ACTIVITY: Basic

TEACHER: Fabiana Crispo, PhD

e-mail: **fabiana.crispo@unibas.it**

website:

phone:

mobile (optional):

Language: **Italian**

ECTS: **12****(8 lessons and 4
tutorials/practice)**n. of hours: **112 (64 lessons
and 48 tutorials/practice)**Campus: **Potenza**
Dept./School: **Science Department**
Program: **Biotechnology**Semester: **annual**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course aspires to provide the students with the fundamental theoretical and technician concepts of analytical chemistry and the basic knowledge of the most common analytical instruments in laboratory. The aim of the course is to lead the students in a critical analysis of experimental results and to show them the potentiality of analytical techniques in the biotechnologies. At the end of the course the students should be competent both in the choice of the most suitable method for analysis and in the execution of the basic analytical techniques in laboratory.

PRE-REQUIREMENTS

- attendance of lectures: **HIGLY** suggested
 - attendance of lab activities: **COMPULSORY**
 - preparatory exams: Istituzioni di Matematica, Fisica, Chimica generale e inorganica
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SYLLABUS

Fundamentals in analytical chemistry: applications of analytical techniques, analytical problems and their solutions, method validation, results analysis. Data errors, statistics and data analysis.

Chemical equilibrium in solution, pH and buffer solution. Titrations. Redox processes, electrochemical reactions and equilibria. Potentiometry, pHmeters, ion selective electrodes.

Spectroscopy: emission, absorption, fluorescence. Instrumentation in spectroscopy, methods and biotechnological applications. Separation techniques and chromatographic methods: fundamentals, instrumentation and biotechnological application. Electrophoresis and capillary electrophoresis.

Immunochemistry and immunoassay: RIA, EIA and FIA.

LAB ACTIVITIES:

- Standard solution, use of analytical scale, dilution.
 - Preparation of a buffer solution
 - Titration of chloridric acid
 - Titration of sodium hydroxide
 - Acetic acid determination in commercial vinegar
 - pH-meter: use of pH-meter, calibration and pH determination in aqueous solution
 - UV-VIS spectrophotometry: use of spectrophotometer, UV-VIS spectrum of cytochrome c, calibration curve.
 - Chromatography lab activity
 - Capillary electrophoresis lab activity
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TEACHING METHODS

Theoretical lessons and practical lab activities with a short introductive lesson.

EVALUATION METHODS

Oral examination with discussion about lab activities.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Students will consult the following books. Supplementary materials will be available for lab activities.

- **Title:** Fondamenti di chimica analitica
Autors: Skoog Douglas A., West Donald M., Holler James F.
Editor: Edises

- **Title:** Chimica analitica strumentale
Autors: Skoog Douglas A., West Donald M.
Editor: Edises

INTERACTION WITH STUDENTS

Email contact for discussions and deepening of lectures and lab activities.

EXAMINATION SESSIONS (FORECAST)¹

Month	Year	Exam date
February	2018	6
March	2018	10
June	2018	26
July	2018	24
September	2018	12
October	2018	30
December	2018	4

EXAMINATION PANEL:

President: Fabiana Crispo, PhD
Member: Prof. Antonio Guerrieri
Member: Prof. Rosanna Ciriello
Member: Prof. Giuliana Bianco

SEMINARS BY EXTERNAL EXPERTS YES NO

FURTHER INFORMATION

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.