

COURSE: Applied Analytical Chemistry			
ACADEMIC YEAR: 2016-2017			
TYPE OF EDUCATIONAL ACTIVITY: Basic			
TEACHER: Bianco Giuliana			
e-mail: giuliana.bianco@unibas.it		website:	
phone: 00390971205451		mobile (optional): 00393405131841	
Language: italian			
ECTS: 2 lessons and 4 tutorials/practice	n. of hours: 18 lessons and 48 tutorials/practice	Campus: Potenza Dept./School: DIS Program: Chemistry (L27)	Semester: I
EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES			
This course will introduce the student to modern instrumental methods of chemical analysis from a practical point of view. The applications associated with optical methods covering molecular UV-vis and atomic absorption spectroscopy, atomic and flame emission spectroscopy, electroanalytical techniques including potentiometric, voltammetric methods. Practice of liquid chromatography with an emphasis on high performance liquid chromatography (HPLC). Practice of gas chromatography with emphasis in capillary GC..			
PRE-REQUIREMENTS			
Exam of Analytical Chemistry II			
SYLLABUS			
Sintetizzare in lingua inglese i contenuti riportati nella scheda in lingua in italiana.			
TEACHING METHODS			
Sampling and sampling methods. Sample storage and packaging materials. Validation of an analytical method, Expression of results: confidence, confidence interval, tests of significance. Shapiro-Wilk test, univariate regression, linear regression using least squares method, correlation coefficient, linearity testing using t test, calibration charts. Practice mode to perform a complete regression. Assessment of uncertainties and the uncertainty of the slope, calculation of standard deviation of y . Calculation of the confidence of the extrapolated value. Tools available for quality assurance of analysis: certified reference materials or not. Concept of traceability. Control charts: Shewhart, Moving average, CUSUM control chart, collaborative studies. Validation of the methods according to UNI CEI EN ISO / IEC 17025; selectivity, limit of detection and limit of quantification. Dynamic range and linear dynamic range. Accuracy and Procedures for the evaluation of precision: repeatability and reproducibility, limit of repeatability and reproducibility limit. Calculation of measurement uncertainty according to the metrological approach, holistic and empirical. Robustness, recovery. Quantitative methods. The course will be accompanied by a series of laboratory exercises on: optical methods covering molecular UV-vis and atomic absorption spectroscopy, electroanalytical techniques including potentiometric, voltammetric methods, liquid chromatography (HPLC) and gas chromatography.			
EVALUATION METHODS			
Discussion of a laboratory report and Oral examination			
TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL			
<ul style="list-style-type: none"> Assicurazione di qualità nel laboratorio chimico, Validazione dei metodi di analisi, Elio Desimoni, Barbara Brunetti, Bologna: CLUEB, 2003 Chimica Analitica Quantitativa, Daniel C. Harris, seconda edizione italiana condotta sulla sesta edizione americana, Bologna: Zanichelli 2005 Skoog, West, Holler, Crouch "Fondamenti di Chimica Analitica", Ed. EdISES slides of the course 			
INTERACTION WITH STUDENTS			
The teacher is open for discussion and additional teaching during the planned weekly colloquia, by email (giuliana.bianco@unibas.it) or by phone (0971 205451)			
EXAMINATION SESSIONS (FORECAST)¹			
June-July-September-October-December 2017 January 2018			

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

LOGO DELLA STRUTTURA PRIMARIA

SEMINARS BY EXTERNAL EXPERTS YES x NO

FURTHER INFORMATION

The lab reports must be submitted to the professor at least 3 weeks before the call for examination
