Main course information	
Academic subject	Analytical Chemistry II (Integrated Course of Chemistry II)
Degree course	
Classe di laurea	L-13
ECTS credits (CFU)	2
Compulsory attendance	yes
Teaching language	Italian
Accademic Year	2018/2019

Docente responsabile	
Name & SURNAME	Antonella Aresta
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Tel.	080-5442021
Tutorial time/day	Tuesday (4 pm-6 pm) and Thursday (11am-1pm)

Course details	Study area	SSD code	Type of class
	Analytical Chemistry	03/01	Characterizing

Teaching schedule	Year	Semester
	2019/2020	II

Modalità erogazione	CFU/ECTS	Lessons (hours)	CFU/ECTS lab	Lab hours	CFU/ECTS tutorial/workshop	Tutorial/workshop hours	CFU/ECTS field trip	Field trip Hours
	1	8	1	15	0	0	0	0

Time management	Total hours	Teaching hours	Self-study hours
	53	23	30

Academic Calendar	First lesson	Final lesson
	To be agreed with Chemistry II lecturer	Scheduled end of courses II semester

Syllabus	
Course entry requirements	Chemistry I and Analytical Chemistry I
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	
Knowledge and understanding	Knowledge and understanding of the main laboratory analytical techniques for the separation, purification and analysis of complex samples.
Applying knowledge and understanding	Ability to properly apply the knowledge learned for determining the analytes surveyed by diagnostics, environmental and/or food.
Making informed judgements and choices	Acquisition of autonomy in the choice and evaluation of the most suitable methodologies for the acquisition of the experimental data necessary to advise on the determination of biological markers, environmental pollutants and/or food.
Communicating knowledge and understanding	Learn the correct analytical terminologies.
Capacities to continue learning	Knowledge of the main laboratory analytical techniques.

Sylabus	
Course content	SEPARATION AND PURIFICATION TECNICHES • Decanting • Filtration (by gravity and under vacuum))

	• Centrifugation • Crystallization • Solvent extraction (distribution law, single extraction vs. multiple extractions, extraction techniques) • Distillation (ordinary pressure, reduced pressure, fractional) • Chromatography techniques (classification, elution and separation process, adsorption and absorption chromatography, ion exchange chromatography, dimensional chromatography, thin layer chromatography, chromatography on paper, high-efficiency liquid chromatography and gas-chromatography). SPECTROSCOPIC TECHNIQUES • UV-visible spectroscopy (generality, Lambert-Beer law, electronic transitions, chemical groups and effects on spectra UV-vis, instrumentation, applications). POTENTIOMETRIC TECHNIQUES • Recall of REDOX reactions • Equation of Nernst, Indicator Electrodes (metallic and membrane), Reference Electrodes • Glass membrane electrode for pH measurements • Potentiometric titrations LABORATORY EXPERIENCES • Use of the pH-meter for pH measurements; • Determination of total protein in urine, by visible spectrophotometry; • Determination of the glycine isoelectric point, by potentiometric titration
Course books/Bibliography	Il Laboratorio di Chimica di M.Consiglio, V. Frenna, S.Orecchio, EdiSES.
Notes	The PowerPoint of the lessons are available as support (they are not handouts)
Teaching methods	Lectures with the use of PowerPoint and laboratory exercises.
Assessment methods (indicate at least the type written, oral, other)	Written, consisting of the presentation of reports concerning the exercises carried out, and oral.
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are	The communication skills acquired through the analysis of the writings and the oral verification of the knowledge learned are assessed. Attendance at the laboratories is mandatory for the purpose of presenting written reports. The presentation of the reports is not enough to pass the exam, but it is necessary to obtain a positive evaluation also at the oral examination. The final evaluation is integrated with that of Chemistry II.
Further information	