

General Information	
Academic subject	Analytical and instrumental chemistry with laboratory
Degree course	Bachelor programme: Food Science and Technology
ECTS credits	6 ECTS
Compulsory attendance	No
Teaching language	Italian

Subject teacher	Name Surname	Mail address
	Ignazio Allegretta	ignazio.allegretta@uniba.it

ECTS credits details			SSD
Basic teaching activities	4 ECTS Lectures	2 ECTS Laboratory classes	CHIM/01

Class schedule	
Period	II semester
Course year	Second
Type of class	Lecture- workshops-laboratory-didactic visits

Time management	
Hours	150
In-class study hours	60
Out-of-class study hours	90

Academic calendar	
Class begins	March 1st, 2022
Class ends	June 17th, 2022

Syllabus	
Prerequisites/requirements	Prerequisites: "Chemistry" Knowledge of general, inorganic and organic chemistry
Expected learning outcomes	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Knowledge and understanding for the choice and use of the most appropriate techniques and calibration methods to solve specific problems concerning food processes <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Ability to select and use appropriate analytical techniques to evaluate food quality ○ Ability to choose the best method for the calibration of the instruments ○ Ability to perform correctly the general or specific sequence of phases of a chemical analysis ○ Ability to follow safety rules in the chemistry laboratory <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> ○ Ability to select appropriate procedures to evaluate important properties of food or other matrices influencing food quality ○ Ability to improve and implement analytical procedures that are appropriate to determine important chemical characteristics of matrices connected to food quality and safety <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Ability to describe the most important methods and instrumentation used for quantitative and qualitative chemical analyses concerning foods or other matrices connected with foods

	<p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> ○ Ability to deepen and update the knowledge of chemical methods and conventional or more advanced analytical techniques useful to assess the quality and safety of food <p>The expected learning outcomes, in terms of knowledge and skills, are listed in Annex A of the Degree Course Regulation (expressed through the European Descriptors of Degree qualification)</p>
indicatioContents	<p>Introduction and general aspects: analytical process, analytical measurements, laboratory instrumentation.</p> <p>Qualitative and quantitative analyses: parameters of the analysis (limit of detection, limit of quantification), experimental error, data distribution, mean and standard deviation, statistical tests, calibration curves (minimum least squares methods), calibration methods (internal standard and standard additions).</p> <p>Titrations: general aspects, final point determination, acid-alkaline titrations, indicators, pH electrode.</p> <p>Spectrophotometry: general aspects, fluorescence and phosphorescence, Lambert and Beer's law, IR/FT-IR, UV-VIS, spectrophotometers (sources, monochromators and detectors), applications.</p> <p>Chromatography: introduction to chemical separations, general aspects (mobile phase, stationary phase, parameters), gaschromatography (separation process, instrumentations, detectors, sample preparation), HPLC (process, analysis, inverse phase separation, gradients), ionic chromatography.</p> <p>Mass spectrometry: general aspects, spectrometers, coupling with chromatography</p>
Course program	
Reference books	<ul style="list-style-type: none"> • Notes of the lectures distributed during the course. • D.C. Harris. Analisi Chimica Quantitativa. Zanichelli.
Notes	
Teaching methods	<p>Lectures will be presented through PC assisted tools (PowerPoint, Adobe Acrobat, etc.).</p> <p>Photos and movies will be also showed during the course with the aim of presenting relevant case studies</p> <p>Educational supplies will be provided by means of a mailing list or online platforms (i.e.: Edmodo, Google Drive...)</p>
Evaluation methods	<p>The exam consists of an oral dissertation on the topics developed during the theoretical and theoretical-practical lectures in the classroom and in the laboratory/production plants, as reported in the Academic Regulations for the Bachelor Degree in Food Science and Technology (article 9) and in the study plan (Annex A).</p> <p>Students attending at the lectures may have a middle-term preliminary exam, consisting of an oral test, relative to the first part of the program, which will concur to the final evaluation and will be considered valid for a year.</p> <p>The evaluation of the preparation of the student occurs on the basis of established criteria, as detailed in Annex B of the Academic Regulations for the Bachelor Degree in Food Science and Technology.</p> <p>Non-Italian students may be examined in English language, according to the aforesaid procedures.</p>
Evaluation criteria	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Ability to describe the criteria of choice and the use of the most appropriate techniques and calibration methods, taught at lectures, to be used for chemical analysis concerning food processes

	<p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Ability to select and use appropriate analytical techniques to evaluate food quality ○ Ability to perform correctly the general or specific sequence of phases of a chemical analysis and to follow safety rules in the chemistry laboratory <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> ○ Ability to elaborate and select appropriate procedures to evaluate important properties of food or other matrices influencing food quality, presented as a case study <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Ability to describe the most important methods and instrumentation used for chemical analyses concerning foods or other matrices connected with foods, presented as a case study <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> ○ Ability to develop new approaches for choosing and applying appropriate methods to determine important constituents in matrices of interest in the food sector, presented as a case study
Receiving times	Monday and Friday, 10.00-13.00 by appointment.