Department of Agriculture, Forestry, Environment, Zootechnics, Agricultural engineering, Foods – AGRARIA

Three-year degree Course in Food Science and Technology – Class L-26

Degree course	Food Science and Technology
Course code	018d#079i
Lecturer	Angelo Maria Giuffrè
Course name	Chemical analyses and Food Control
Disciplinary area	07/F1 – Food Science and Technology
Disciplinary field of science	AGR 15
University credits - ECTS	6
Teaching hours	60
Course year	third
Semester	second

Synthetic description and specific course objectives

The program will be held with lectures and laboratory exercises. At the end of the course, students will have the necessary knowledge on the regulations concerning food analysis as well as the execution and the meaning of the analyses.
At least one lesson will be conducted in English language.

Knowledge and understanding:
Basic knowledge of the principles of food analysis for a correct management of laboratory analysis methods.

Ability to apply knowledge and understanding:
Ability to independently apply what learned to solve common problems in the field of food analysis.

Autonomy of judgment:
Being able to evaluate the appropriate analysis to be carried out as well as evaluate and critically criticize the analytical result.

Communication skills:
Being able to explain in writing and oral the evaluations and the application of what has been learned during the course, using an appropriate technical-scientific terminology, in order to relate with other technicians specializing in the field.

Learning skills:
Learning the basic concepts of chemical analysis of food products using the knowledge acquired in the course.

Examination method:
At the request of the student, the final exam can be carried out: in Italian, in English and in French.

Course entry requirements

In order to deal with chemical analyses of food products it is essential that the student has acquired the skills of analytical chemistry. Some references to the analytical problem are necessary: accuracy and precision of a measurement, repeatability, reproducibility, sensitivity and linearity of an analytical determination. It is also appropriate to classify chemical analyses: qualitative and quantitative: gravimetric, volumetric, titrimetric and chromatography. Principles of spectrophotometry and outline of the main chromatographic techniques. The student must also be able to perform some mathematics calculations.

Course programme

Preliminary operations (0.5 CFU). 1.Sample preparing for analysis. 2.Separation by sedimentation and filtration. 3. Balances. 4. Measuring unities. 5.Titrated solutions and titration. 6.Practical exercise including examples of analytical quantification.

Oleaginous seeds and vegetable oils (1.0 CFU). ***Seeds.*** 7.Determination of moisture. 8.Determination of solids. 9. Determination of oil content. **OIL.**10.Determination of free acidity. 11.Determination of peroxide number. 12. Fatty acids.

Wine (1.0 CFU). 12.Determination of the acidity (total, fixed and volatile). 13.Determination of the alcoholic degree by Malligand.

Milk and Water (1.0 CFU). 14.Determination of the milk acidity. 15. Determination of the total water hardness.

Chromatography (0.5 CFU). Thin layer chromatography. Gas-chromatography. High pressure liquid chromatography. Qualitative and quantitative determinations.
Quantitative determinations (0.5 CFU). 16. Quantitative spectrophotometric determination of a unknown liquid extract.

HACCP (1.5 CFU). 17.Meaning. Cleaning and sanitization. Detergents and sanitizing agents. How to prepare a HACCP plan.

Expected results

The student will be able to carry out some food analyses on food using official methods.
The student must also know the regulations concerning the preparation of a HACCP plan and the predisposition criteria in order to be able to carry out a auto-control plan.

Course structure and teaching

Lectures *(45):*
Practical class *(15):*
Practical / Workshops *(5):*

Student's independent work

As part of the preparation of a Auto-Control System, the student must prepare a flow chart and a auto-control grid for a food activity of his choice.

Testing and exams

At the request of the student, the final exam can be carried out: in Italian, in English and in French.

The final exam consists of:
1) written exercises;
2) oral exam;
3) presentation and comment of a flow chart and a auto-control grid prepared by the student as part of a Auto-Control System for a food activity chosen by the student.

Each written exercise given to the student is given a score which will serve to form the final mark of the exam after the oral part has taken place. Even if the responses to the written exercises will be wrong the student can to take the oral part of the exam.

Suggested reading materials

1. Analisi chimica strumentale. Volume C, Metodi cromatografici. Metodi di misura e trattamento dei dati. Autori: Renato Cozzi, Pierpaolo Protti, Tarcisio Ruaro. Editore Zanichelli.
2. Analisi dei prodotti alimentari. Autore: Fernando Tateo. Editore CHIRIOTTI.
3.Gazzetta Ufficiale della Repubblica Italiana serie generale n.185 del 11.08.2003.
4.Il manuale di autocontrollo.S. Agrigento, A. Bertoldi.EPC Libri -2000.
5.Igiene alimentare e HACCP. Maria Pina De Filippo – Andrea Setini. Maggioli Editore, 2014.

a.Testo consolidato – CONSLEG: 01991R2568 — IT — 04.12.2016 — 031.005 — 1, edito dalla Comunità Europea, contenente le metodiche di analisi dell'olio di oliva, applicabili anche agli altri oli vegetali. (Reperibile su Internet).
https://eur-lex.europa.eu/legal-content/IT/ALL/?uri=CELEX%3A01991R2568-20161204

b. Regolamento Europeo Metodiche Analisi Vini. Reperibile su Internet
https://eur-lex.europa.eu/legal-content/IT/TXT/?uri=uriserv:OJ.C_.2010.043.01.0001.01.ITA