General Information	
Academic subject	Instrumental analyses for food quality (I.C. Foods and applied nutrition)
Degree course	Master program: Food Science and Technology (LM-70)
ECTS credits	3 ECTS
Compulsory attendance	No
Teaching language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Giacomo Squeo	giacomo.squeo@uniba.it	AGR 15

ECTS credits details		
Basic teaching activities	2 ECTS Lectures	1 ECTS Laboratory or field classes

Class schedule	
Period	I Semester
Course year	Second
Type of class	Lectures and laboratory exercitation

Time management	
Hours	75
In-class study hours	30
Out-of-class study hours	45

Academic calendar	
Class begins	September 27th, 2021
Class ends	January 21st, 2022

Syllabus	
Prerequisites/requirements	General knowledge about i) foods composition, ii) indices of quality, and iii) notions of analytical chemistry.
Expected learning outcomes	*Knowledge and understanding* o Knowledge and understanding about destructive and non-destructive, target and non-target analytical methods applied for the assessment of food quality. Understanding of the issues of planning an experiment. *Applying knowledge and understanding* o Ability to apply the analytical methods for the determination of food quality and relative data elaboration. *Making informed judgements and choices* o Ability to choose the proper analytical procedures and methods able to assess food quality and evaluate the goodness of the results. *Communicating knowledge and understanding* o Ability to describe the analytical procedures and methods able to assess the quality parameters of foods and relative advantages and disadvantages. *Capacities to continue learning* o Ability to deepen and update the knowledge regarding analytical procedure for the food quality assessment. Understand and improve the skills in experiments planning. The learning outcomes, in terms of knowledge and ability, are detailed in the Regulation of Bachelor in Food Science and Technology - Annex A (expressed by European descriptors in the framework of food technology field).
Contents	Spectroscopic and optical non-destructive methods of analysis (NIR, IR, Imaging, Color).

	Background and basic principles; instrumentation; qualitative applications; quantitative applications. Basic notions of chemometrics for multivariate data exploration and elaboration. Texture and rheology analysis. Methods for texture assessment; instrumentation; compression-extrusion, shear, crushing, tensile, torque, and bending tests; examples of application. Introduction to the rheology of food systems; instrumentation; applications. Notions of design of experiments for food quality.
Course program	
Reference books	• Notes of the lectures distributed during the course (all the support materials are available online by means of the Edmodo educational network). • Cabras P., Tuberoso C.I.G. – Analisi dei Prodotti Alimentari. Piccin edizioni 2010. • Montgomery, D. C. (2017). Design and analysis of experiments. John Wiley & Sons. • Stewart, G. F., Schweigert, B. S., Hawthorn, J., & Bourne, M. (2012). Food texture and viscosity: Concept and measurement. Academic Press. • Brereton, R. G. (2007). Applied chemometrics for scientists. John Wiley & Sons.
Notes	
Teaching methods	All the topics will be treated through Power Point presentations, videos and laboratory exercitations. on-line platforms such as Edmodo, google drive, mailing list of students to provide didactic materials and to interact with the students will be moreover used.
Evaluation methods	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). Students attending at the lectures may have a middle-term preliminary exam, consisting of a written test, relative to the first part of the program, which will concur to the final evaluation and will be considered valid for a year. 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. Non-Italian students may be examined in English language, according to the aforesaid procedures.
Evaluation criteria	*Knowledge and understanding* o Prove to know the analytical methods for the assessment of the food quality. Knowledge about the basics of multivariate data analysis and experimental design. *Applying knowledge and understanding* o Prove to be able to apply the analytical methods for the assessment of food quality; to plan an experiment and draw sound conclusion about the food quality. *Making informed judgements and choices* o Prove to be able to choose the correct analytical method for the assessment of food quality as well as for data elaboration according to the specific problem. *Communicating knowledge and understanding*

	o Prove to be able to communicate the analytical procedures applied in food analysis context as well as the approaches for the elaboration of the obtained data. Be able to describe an experimental plan. *Capacities to continue learning* o Prove to be able to deepen and update the knowledge regarding analytical procedures applied in food analysis context and the analysis of multivariate data.
Receiving times	Monday-Friday, 9-11 am and 3-5 pm after agreement by e-mail.