General Information	
Academic subject	Unit operations of food technology
Degree course	Bachelor programme: Food Science and Technology
ECTS credits	6 ECTS
Compulsory attendance	No
Teaching language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Francesco Caponio	francesco.caponio@uniba.it	AGR/15

ECTS credits details		
Basic teaching activities	5 ECTS Lectures	1 ECTS Laboratory or field classes

Class schedule	
Period	II semester
Course year	First
Type of class	Lectures Laboratory or field classes Video Didactic visit

Time management	
Hours	150
In-class study hours	54
Out-of-class study hours	96

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

Syllabus	
Prerequisites/requirements	Knowledge of the principles of mathematic and physic
Expected learning outcomes	*Knowledge and understanding* ○ Knowledge of the main unit operations and processing technologies in food industry ○ Knowledge of the couple processing-quality *Applying knowledge and understanding* ○ Ability to understand structure-function relationships in food systems and their changes during processing ○ Ability to apply correct processing conditions to ensure food quality and safety ○ Ability to apply theory and laws underlying unit operations to better address processing issues *Making informed judgements and choices* ○ Ability to correctly direct choices and solutions in food processing to ensure high quality standards ○ Ability to evaluate individual unit operations as regards energy consumption and cost minimization *Communicating knowledge and understanding* ○ Ability to correctly describe unit operations and their relationships with food quality and safety *Capacities to continue learning* ○ Ability to deepen and update knowledge of processing-quality interactions The expected learning outcomes, in terms of both knowledge and

	skills, are provided in Annex A of the Academic Regulations of the Degree in Food Science and Technology (expressed through the European Descriptors of the qualification)
Contents	**Classification and aims of unit operations. The raw materials and preliminary operations.** *Cleaning, sorting, grading, size reduction.* **Mixing, emulsion and forming.** *Theory of solid and liquid mixing; food emulsions.* **Separation and concentration of food components.** *Milling, filtration, inverse osmosis, ultrafiltration, centrifugation, distillation, solvent extraction.* **Heat transfer in food processing. Processing by application of heat.** *Pasteurisation, sterilisation, evaporation, dehydration, blanching, cooking, frying, thawing.* **Use of low temperature.** *Freeze-drying, refrigeration, freezing.*
Course program	
Reference books	• Notes of the lectures distributed during the course. • R.P. Singh, D.R. Heldman. Principi di tecnologia alimentare. Casa Editrice Ambrosiana • C. Pompei. Operazioni unitarie della tecnologia alimentare. Casa Editrice Ambrosiana • C. Lerici, G. Lercker. Principi di tecnologie alimentari. Clueb, Bologna • C. Peri. Le operazioni fondamentali della tecnologia alimentare. Cusl, Milano • C. Peri. La filtrazione nelle industrie alimentari. Edizioni Aeb, Brescia • P. Cappelli, V. Vannucchi. Chimica degli alimenti. Conservazione e trasformazioni. Zanichelli, Bologna Additional readings: • R.P. Singh, D.R. Heldman. Introduction to food engineering, 3rd edition. Academic Press • Fellows. Food Processing technology, 2nd edition. Woodhead Publishing limited
Notes	
Teaching methods	Lectures will be presented by means of Power Point presentations, videos with views of real industrial plants, didactic visit, case-studies and laboratory exercitations. Lecture notes and educational supplies will be provided by means of online platforms (i.e.: Edmodo).
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* ○ Describing unit operations in food industry and processing-quality interactions *Applying knowledge and understanding* ○ Describing theory and laws underlying unit operations and changes involving food constituents *Making informed judgements and choices* ○ Expressing reasonable hypotheses regarding choices and solutions in food processing to ensure high quality standards *Communicating knowledge and understanding* ○ Describing the relationships of unit operations with food quality and safety *Capacities to continue learning* ○ Hypothesizing processing solutions to minimize the impact of processing on food quality
Receiving times	From Monday to Friday 8.30 a.m. – 1.30 p.m. and 2.30 p.m. – 5.30 p.m. previous agreement.