Syllabus

Course Description

Course Title	Innovative Food Processing Technologies
Course Code	44752
Course Title Additional	
Scientific-Disciplinary Sector	AGRI-07/A
Language	English
Degree Course	Master in Food Sciences for Innovation and Authenticity
Other Degree Courses (Loaned)	
Lecturers	Prof. Giovanna Ferrentino, Giovanna.Ferrentino@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/36045
Teaching Assistant	
Semester	First semester
Course Year/s	2nd
CP	6
Teaching Hours	36
Lab Hours	24
Individual Study Hours	90
Planned Office Hours	18
Contents Summary	The course aims to provide knowledge and understanding of the basic principles, effects and main applications of the innovative technologies in the field of food industry. Moreover, the course will provide information on the qualitative aspects and stability of food products obtained using the innovative technologies. The followed approach is both descriptive and quantitative. The description of the physical, chemical and / or biological changes induced to the food during a treatment is intended to assess the impact that the process has on the quality of the final products. The quantitative approach provides the tools for choosing the innovative process that tends to minimize the deleterious effects

	on food. For some of the proposed innovative processes, laboratory activities are planned with the aim of showing the plants and the effects on the treated food.
Course Topics	1. Fundamentals - Definitions and objectives of innovative technologies in food processing - Application of mass and energy balances to food processes 2. Extraction and Recovery - Innovative technologies for the extraction of food components 3. Stabilization and Preservation - Innovative technologies for the pasteurization of food products 4. Drying and Dehydration - Innovative technologies for the drying of food products
Keywords	Innovative technologies; Food quality; Sustainable processes
Recommended Prerequisites	Knowledge in mathematic and physic.
Propaedeutic Courses	None
Teaching Format	The course combines frontal lectures with laboratory sessions. During lectures, theoretical aspects are presented and reinforced through exercises and practical examples. Teaching is supported by advanced methodologies, including case studies, and by the use of up-to-date tools such as PowerPoint slides, scientific publications, articles from the food sector, and multimedia resources (e.g., videos). Laboratory activities are designed to provide hands-on experience, allowing students to apply and consolidate the knowledge acquired during lectures through practical demonstrations and experiments.
Mandatory Attendance	No
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding: Deep understanding of the technological, microbiological, biochemical, chemical, and physical principles underlying food transformation processes and responsible for food product degradation, ensuring their stability and prolonging their shelf life. These knowledge areas will be developed through an educational program that integrates theoretical teaching activities with practical

	activities, such as laboratory exercises, computer simulations, simulations of food processes using pilot plants, and company visits. Ability to apply knowledge and understanding: Ability to manage the technological, microbiological, biochemical, chemical, and physical processes that drive food transformation and the main issues related to the stability and shelf life of food products. Ability to plan and develop analytical techniques, innovative products, and processes using a multidisciplinary approach, with particular attention to local food productions. Making judgements: Independent judgement is developed through a training programme designed to stimulate critical analysis in students. This includes the use of case studies, simulations using spreadsheets and videos, the reading and critical discussion of scientific articles, as well as specialist seminars held by experts in the food sector. The assessment of the independent judgement acquired by students is entrusted to the individual teachers responsible for the training activities, who will assess it through oral and/or written reports on specific topics and/or through exams. Communication skills: Use of the English language, both written and spoken, at a B2 level, with a command of technical and scientific vocabulary related to food science. Structure and draft scientific and technical documentation describing project activities. Interact and collaborate in the design and development of products and processes with peers and industry experts. Learning skills: The degree course provides graduates with the cognitive skills, logical tools and familiarity with new information technologies necessary to ensure continuous updating of knowledge, both in their specific professional field and in the field of scientific research.
Specific Educational	None.

Objectives and Learning Outcomes (additional info.)	
Assessment	Written exam consisting of multiple-choice and open-ended questions. Oral exam including a PowerPoint presentation. Laboratory reports submitted at the end of each activity will also be evaluated.
Evaluation Criteria	Successful completion of the examination will result in a grade ranging from 18 to 30 with honors. Assessment will be based on the following criteria: Clarity of presentation and accuracy of answers during both written and oral examinations. Mastery of language, with particular attention to the teaching language used. Ability to summarize effectively and present information in a coherent manner. Capacity to evaluate and establish connections between different topics covered in the course. Demonstrated critical thinking and reflective analysis. Quality of laboratory reports, including completeness, scientific rigor, and clarity of presentation
Required Readings	• Slides, keynotes and scientific papers provided by the lecturers • Emerging Technologies for Food Processing. Edited by:Da-Wen Sun • Supercritical Fluid Extraction: Principles and Practice. Edited by: Mark A. McHugh, Val J. Krukonis • Innovative Food Processing Technologies. Edited by: Kai Knoerzer and Kasiviswanathan Muthukumarappan
Supplementary Readings	None.

Further Information	None.
Sustainable Development Goals (SDGs)	Industry, innovation and infrastructure