Syllabus

Course Description

Course Title	Advanced machines and plant in agrifood industry
Course Code	44766
Course Title Additional	
Scientific-Disciplinary Sector	AGRI-04/B
Language	English
Degree Course	Master in Food Sciences for Innovation and Authenticity
Other Degree Courses (Loaned)	
Lecturers	prof. ass. Marco Bietresato, Marco.Bietresato@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/32764
Teaching Assistant	
Semester	First semester
Course Year/s	2nd
CP	3
Teaching Hours	20
Lab Hours	10
Individual Study Hours	45
Planned Office Hours	9
Contents Summary	The course is part the profile "Food quality control and management", hold in Udine. The course is designed to complete the preparation of students about machines and plants for food industry and prepare students to work autonomously in the food research and development sector. Specifically, the attendants will be provided theoretical and practical fundamentals of the basic operating principles of a food production line, focusing on the technical and functional features of the equipment to be used, with specific focus to some technologies (listed in the topics section). In addition, the student will acquire soft skills connected to scientific presentations or reports.

	https://www.uniud.it/it/didattica/corsi/area-scientifica/agraria/laurea-magistrale/scienze-e-tecnologie-alimentari/corso/regolamento-corso/all-B2
Course Topics	Part 1: Basic Concepts • A review of the most important concepts in Physics and Plant Engineering with particular attention to thermodynamics and fluid mechanics, and systems for handling liquids and solids. Part 2: Plant technologies (machinery and components of plants for mass and energy transfer) • Systems for mechanical solid-liquid separation (types of presses, components, operation, performance – extraction efficiency) • Systems for decantation, centrifugation and flotation (principles, types, components, operation) • Filtration systems (types, filter media, pre-panel and alluvial filtration, filtration aiding materials, filters) • Air-drying systems (principles, process stages, plant types, components, operation)
Keywords	
Recommended Prerequisites	Basic concepts of Mathematics, Physics, Technical Physics, Food Industry Machinery and Plants
Propaedeutic Courses	
Teaching Format	Frontal lectures (ppt presentations at the beamer by the lecturer) + flipped classroom (ppt presentations of project advancements by the students)
Mandatory Attendance	No
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding of the conceptual design and planning of an industrial food production line, including insights in machinery operations and related physical running principles. Applying knowledge and understanding in scientific and professional environments, focusing on specific case studies. Applying analytical and modelling tools for conceptual and practical designing of production lines. Making judgments when assessing different solutions for a given

	technological application on the basis of its technical, organizational and economic performances. Achieving the basis for investment assessment. Communication skills in presenting scientific results in written and oral form, in particular using an appropriate English language, as well as proper graphical tools for exhaustive analytical reports. Learning skills concerning the ability to find information on the web and access their validity, to use and transmit the technical knowledge acquired in the course.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	At the beginning of the semester, students will be asked to choose a product/production line, which they will be required to study in depth independently (covering processes, machinery, plant and process settings) and to present their progress during dedicated classroom discussion sessions. The final examination will consist of an assessment of the project-work that each student will have previously prepared and presented orally during the final examination.
Evaluation Criteria	The criteria that will be relevant for assessment will consider clarity of project-work exposition and answers, mastery of language, ability to summarize, evaluate, and establish relationships between topics, capability of managing graphical designing tools.
Required Readings	Material distributed by the lecturer.
Supplementary Readings	Notes/slides of the lessons. Consultation textbooks: · Amirante P., Lezioni di Macchine e Impianti. Parte I, (https://www.researchgate.net/publication/ 271899243_Lezioni_di_Macchine_e_Impianti_-_parte_1) · Fabbri A., Appunti di Impianti dell'Industria Alimentare,

	(https://www.unibo.it/sitoweb/angelo.fabbri/didattica) · Friso D., Ingegneria dell'Industria Alimentare. Operazioni Unitarie del Food Engineering. Macchine e Impianti, C.L.E.U.P., 2013, ISBN: 8867871374 · Monte A., Elementi di Impianti Industriali, Edizioni Libreria Cortina, 2010, Torino, ISBN: 8882391442 · Pareschi A., Impianti Industriali, Edizioni Progetto Leonardo, 2007, ISBN: 9788874882342. · Parolini P., Impianti industriali meccanici: produzione e distribuzione del calore, trasporto dei fluidi, Clupguide, 1990, Milano, ISBN: 8870058824 · Pierfederici O., Impianti meccanici, Pitagora Editrice, 1980, Bologna, ISBN: 8837100396. · Pompei C., Operazioni unitarie della tecnologia alimentare, Casa editrice Ambrosiana, 2009, ISBN: 9788808183422 · Singh R.P., Heldman D.R., Principi di Tecnologie Alimentari, Casa Editrice Ambrosiana, 2015, ISBN: 9788808187468 Turco F., Principi generali di progettazione degli impianti industriali, CittàStudi, 2012, Milano, ISBN: 8825170831
Further Information	
Sustainable Development Goals (SDGs)	Industry, innovation and infrastructure