Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Food structure control and management
Course code	44713
Scientific sector	Agr/15
Degree	Master
Semester	1st
Year	II
Academic year	2022/23
Credits	6
Modular	No

Total lecturing hours	40
Total exercise hours	20
Attendance	
Prerequisites	Knowledge of unit operations of food technology
Course page	

Specific educational objectives	Type of course: area caratterizzante Scientific area: Food Technology The course is part the profile "Food quality control and management" The structural complexity of food materials will be illustrated as the result of the interactions among different components under non-equilibrium conditions. The principles of food microstructural engineer required to predict and control biomolecules interactions and their consequences will be presented. An overview of analytical methodologies applicable for food structure evaluation (particle size, thermal, optical and electric properties) will be provided, critically discussing the role of the different analytical conditions. Food physical properties as a result of structural interactions. Food structure preservation, destruction, transformation and creation. Polymer science, colloid science, material science. The dynamic multiphase nature of foods. Basic material science concepts - Glass transition. Gordon-Taylor equation. Molecular mobility. WLF equation. Non equilibrium state diagrams. Modified state diagrams. Stickiness. Collapse. - Sol systems. Macro- and nano- disperse systems. Characterization of disperse systems. Formation and destabilization. Surfactants, HLB, HLD. Disperse systems of polymers. DLVO theory. Excluded volume. Intrinsic viscosity. W/W disperse systems. Segregative and associative phase separation. Phase diagrams. - Gels. Classification. Properties. Phase

	diagrams. Mixed gels. Food physical properties - Particle size and zeta potential analysis - Optical properties. Color measurement. Image analysis. - Thermal properties. TG, DTA, DSC, TMA, DTMA. The course includes lessons, working in groups, practices, laboratory activities, report preparation, experimental data presentation.

Learning outcomes	Students are expected to: -recognize the structural complexity of food materials as a result of the interactions among different components under non-equilibrium conditions; - understand the relations between structure of foods and their physical properties following processing and storage; - define analytical protocols to evaluate physical properties of food materials; - develop independent thinking, communication skills, learning and team working capability.

Assessment	Written with review questions.
Assessment language	English
Evaluation criteria and criteria for awarding marks	Final mark: clarity and organization of the answers, mastery of technical language, ability to establish relationships between topics.

Required readings	
Supplementary readings	