Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Sample Preparation Techniques and Analysis of Contaminants
Course code	44747
Scientific sector	CHIM/10
Degree	Master in Food Sciences for Innovation and Authenticity
Semester	1st
Year	II
Academic year	2023/24
Credits	6
Modular	No

Total lecturing hours	50
Total exercise hours	10
Attendance	
Prerequisites	Food Chemistry
Course page	

Specific educational objectives	The course gives a general overview of scientific contents, but is also designed for acquiring professional skills and knowledge on the following educational objectives: • Principle, parameter optimization and basic applications of innovative sample preparation techniques: supercritical fluid extraction (SFE), pressurized liquid extraction (PLE), microwave assisted extraction (MAE), membrane-based extraction, solid phase extraction (SPE), solid phase micro extraction (SPME), stir bar sorptive extraction (SBSE), headspace sorptive extraction (HSSE), headspace tecniques, purge and trap. • Principle, advantages and application of hyphenated, multidimensional chromatographic techniques: coupled LC-LC and LC-LC-GC, LC-GC and GCxGC. • Chemical properties, origin, toxicity, distribution and analytical determination of the main organic contaminants in foods: PAHs, PCBs, dioxins, mineral oils, mycotoxins and residues of pesticides, antibiotics, anabolizing substances, and hormones.

Learning outcomes	• Knowledge and understanding of principles and basic applications of advanced sample preparation techniques and coupled chromatographic

	techniques for the analysis of trace contaminants in food. • Knowledge and understanding of main classes of organic contaminants in food (focusing on toxicity aspects, European legislation, and analytical techniques for their determination). • Acquire the skills to select and apply proper sample preparation methods and to understand and communicate health risks due to the presence of food contaminants • Acquire appropriate terminology and learning skills

Assessment	Oral examination to ascertain the achievement of the expected learning outcomes
Assessment language	English
Evaluation criteria and criteria for awarding marks	Clarity of answers, mastery of language (also with respect to teaching language), ability to establish relationships between topics

Required readings	Lecture notes
Supplementary readings	- Moret, G. Purcaro, L.S. Conte, Il campione per l'analisi chimica, Springer-Verlag Italia, Milano (2014) - Dean J.R., Extraction techniques in analytical science; Wiley (2009). - Mondello, Lewis and Bartle, Multidimensional Chromatography, Wiley and Sons, New York (2002). - Food Chemical safety Vol. 1: Contaminants, edited by David Watson, Published by Woodhead Publishing (2001).