

Syllabus  
Course description

<b>Course title</b>	<b>Evaluation of Food Quality and Authenticity</b>
<b>Course code</b>	44751
<b>Scientific sector</b>	CHIM/10
<b>Degree</b>	Master in Food Sciences for Innovation and Authenticity
<b>Semester</b>	I
<b>Year</b>	I
<b>Academic year</b>	2023/24
<b>Credits</b>	6
<b>Modular</b>	No

<b>Total lecturing hours</b>	36
<b>Total lab hours</b>	24*2
<b>Total exercise hours</b>	
<b>Attendance</b>	Yes
<b>Prerequisites</b>	It is advisable for students to have a foundational understanding of food science principles, including food chemistry and food processing. A basic understanding of chemistry is often necessary, as the course may involve chemical analysis techniques for food quality assessment.
<b>Course page</b>	

<b>Specific educational objectives</b>	<p><b>Aims</b></p> <p>This course provides an in-depth study of the techniques used to evaluate the quality and authenticity of food products. Students will explore advanced aspects of food analysis, including physical and chemical analysis methods, emerging technologies for authenticity testing, and research approaches to combat food fraud. The course aims to provide students with advanced knowledge and skills to ensure food safety, quality, and integrity in the complex food industry. Students take an active role in learning course content (presented via Power Point presentations), which is available to class participants on the Teams of the course, as well as laboratory activities.</p> <p><b>Educational objectives:</b></p> <ol style="list-style-type: none"> <li>1) Comprehensive Understanding: By the end of the course, students should have a comprehensive understanding of the concepts of food quality and authenticity, and their significance in the food industry.</li> <li>2) Practical Laboratory Skills: Students should develop skills in chemical analysis applied for food quality and authenticity evaluation.</li> <li>3) The students can describe the main analysis needed for quality control and how to report the</li> </ol>
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	<p>results of the analysis.</p> <p>4) Emerging Technologies: Familiarize students with emerging technologies used in food authentication, such as nuclear magnetic resonance, mass spectrometry, isotopic analysis, electronic noses and tongues.</p>
<b>Lecturer</b>	<p>Dr. Ksenia Morozova, NOI Tech Park,  <a href="mailto:ksenia.morozova@unibz.it">ksenia.morozova@unibz.it</a>,            Tel. +39 0471 017211</p> <p>Dr. Maria Concetta Tenuta  <a href="mailto:mariaconcetta.tenuta@unibz.it">mariaconcetta.tenuta@unibz.it</a></p> <p>Dr. Antonella Luciana Grosso  <a href="mailto:antonellaluciana.grosso@unibz.it">antonellaluciana.grosso@unibz.it</a></p>
<b>Scientific sector of the lecturer</b>	AGR/15
<b>Teaching language</b>	English
<b>Office hours</b>	10
<b>Teaching assistant</b>	Alessandra Gasparini
<b>List of topics covered</b>	<p>These five main topics provide an introductory understanding of the course's core concepts and emphasize the importance of evaluating food quality and authenticity using sensory, chemical, and technological approaches.</p> <p><b>Food Quality and Authenticity: Basic Definitions</b></p> <p>Food quality refers to the characteristics and attributes of a food product that make it suitable for consumption. Food authenticity refers to the genuineness and integrity of a food product, ensuring that it is accurately labeled and free from adulteration or fraud. These concepts are critical for consumer trust and safety in the food industry.</p> <p><b>Food Adulteration and Fraud Detection</b></p> <p>Food adulteration refers to the intentional addition of secondary or fraudulent substances to food products for economic gain. This topic covers the identification and detection of common food adulterants, the impact of adulteration on food quality and consumer appreciation, and analytical methods for detecting and preventing food fraud cases.</p> <p><b>Sensory Evaluation Techniques</b></p> <p>Sensory evaluation techniques involve the systematic assessment of food products by human senses, such as taste, smell, touch, sight, and hearing. These techniques</p>

	<p>are used to measure and describe the sensory attributes of food, providing valuable insights into consumer preferences and perceptions.</p> <p><b>Chemical Analysis for Food Evaluation</b></p> <p>Chemical analysis in food evaluation encompasses a wide range of laboratory techniques used to determine the chemical composition of food products. This includes nutritional analysis, identification of additives and contaminants, and quantification of key components such as vitamins, minerals, and flavor compounds.</p> <p><b>Emerging Technologies in Food Authentication</b></p> <p>Emerging technologies in food authentication encompass innovative methods and tools used to verify the authenticity of food products. This includes nuclear magnetic resonance, mass spectrometry, isotopic analysis for origin verification, electronic noses and tongues for rapid sensory profiling, and hyperspectral imaging for non-destructive quality assessment.</p>
<b>Activity</b>	Frontal lectures, exercises, labs, projects

<b>Learning outcomes</b>	<p>The learning outcomes are:</p> <p><b>Knowledge and understanding</b></p> <p>Students are expected to demonstrate a comprehensive understanding of the concepts of food quality and authenticity, including their definitions, significance in the food industry, and the impact on consumer trust and safety. Students will gain familiarity with emerging technologies used in food authentication and understand their applications in verifying food authenticity. They will also be knowledgeable about analytical methods for detecting and preventing food fraud incidents. Students will understand the principles of quality assurance and control in food manufacturing.</p> <p><b>Applying knowledge and understanding</b></p> <p>The student will be able to apply the theoretical knowledge food quality and authenticity. Student will be able to apply the theoretical knowledge of analytical methods in practice during laboratory exercises.</p> <p><b>Making judgements</b></p> <p>The student will be able to analyze and compare the</p>
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	<p>chemical properties of foods and their effect on their quality.</p> <p><b>Communication skills</b> Communication skills will be evaluated in class through the discussion of case studies and in the lab through the evaluation of the laboratory activity.</p> <p><b>Learning skills</b> The student will learn practical laboratory methods to analysis of food quality and authenticity.</p>
<b>Assessment</b>	The assessment includes an oral exam (70%) practical laboratory part (30%).
<b>Assessment language</b>	English
<b>Evaluation criteria and criteria for awarding marks</b>	<p>The evaluation consists of:</p> <ul style="list-style-type: none"> <li>• Oral exam</li> <li>• Written laboratory reports</li> </ul> <p>Criteria for the oral examination:</p> <ul style="list-style-type: none"> <li>• Knowledge of the main aspects of the food quality and authenticity.</li> <li>• Understanding of the analytical methods for evaluation of food quality and authenticity.</li> <li>• Ability to communicate in a concise and precise way.</li> </ul> <p>Criteria for the written laboratory reports:</p> <ul style="list-style-type: none"> <li>• Students must complete a written report after each laboratory exercise based on their obtained results.</li> </ul>
<b>Required readings</b>	Slide and spreadsheets discussed during the lecture.
<b>Supplementary readings</b>	<ul style="list-style-type: none"> <li>○ Wrolstad, Ronald E., et al. Handbook of food analytical chemistry: pigments, colorants, flavors, texture, and bioactive food components. John Wiley and Sons, Inc, 2005.</li> <li>○ Nielsen, S. Suzanne, ed. Food analysis. New York: Springer, 2010.</li> <li>○ Lees, Michèle, ed. Food authenticity and traceability. Elsevier, 2003.</li> <li>○ Montet, Didier, and Ramesh C. Ray, eds. Food traceability and authenticity: Analytical techniques. CRC Press, 2017.</li> </ul>