Syllabus

Course Description

Course Title	Laboratory of Wood Chemistry
Course Code	42604
Course Title Additional	
Scientific-Disciplinary Sector	NN
Language	German
Degree Course	Professional Bachelor in Wood Technology
Other Degree Courses (Loaned)	
Lecturers	Dott. Raphael Tiziani, Raphael.Tiziani2@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/38727
Teaching Assistant	
Semester	First semester
Course Year/s	1
CP	3
Teaching Hours	0
Lab Hours	30
Individual Study Hours	45
Planned Office Hours	9
Contents Summary	• Fundamentals of the analytical process • Fundamentals of analytical chemistry • Extraction of the chemical components of wood • Fundamentals of techniques used for the chemical analysis of wood, such as HPLC, GC, and corresponding detectors • ICP-MS/OES • Application of these techniques in the chemical laboratory
Course Topics	Fundamentals of the Analytical Process Teaching the steps of the analytical process from sampling and sample preparation to quantitative and qualitative evaluation.

	Fundamentals of Analytical Chemistry Introduction to the principles of analytical chemistry, including measurement accuracy, calibration, detection limits, and sources of error. Extraction of the Chemical Components of Wood Overview of various methods for extracting the chemical components of wood. Fundamentals of Techniques Used for the Chemical Analysis of Wood such as HPLC, GC, and Corresponding Detectors Introduction to chromatographic separation methods (HPLC, GC) and their detection systems for the identification and quantification of organic wood components. ICP MS/OES Explanation of the function and application of ICP mass spectrometry (ICP-MS) and optical emission spectrometry (ICP-OES) for the analysis of inorganic elements in wood. Application of These Techniques in the Chemical Laboratory Practical implementation of analytical methods in the laboratory for the investigation of wood samples and the evaluation of the resulting data.
Keywords	Analytics, Analytical Chemistry, Wood Analysis, Instrumental Analysis
Recommended Prerequisites	None.
Propaedeutic Courses	
Teaching Format	Frontal lectures and lab exercise.
Mandatory Attendance	No attendance requirement.
Specific Educational Objectives and Learning Outcomes	Students learn the analytical process, starting with careful sampling followed by sample preparation to ready the sample for analysis. In analytical chemistry, various methods are employed to determine the chemical composition and structure of materials. Students become familiar with fundamental techniques such as High-Performance Liquid Chromatography (HPLC), Gas Chromatography (GC), and Mass Spectrometry, particularly

	Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). These techniques are crucial for the chemical analysis of wood as they enable the identification, quantification, and characterization of the complex chemical composition of wood samples. In the chemical laboratory, these methods are used to obtain detailed information about the chemical structure, concentration of compounds, and presence of trace elements in wood materials, which is important for research, quality control, and environmental analysis. Additionally, students will apply these techniques in the laboratory themselves. Students should gain a thorough understanding of wood analytics to grasp the specific requirements and challenges involved in analyzing wood samples. This includes understanding various methods for identifying and quantifying chemical compounds and elements in wood, including separation and detection techniques. They need to clearly comprehend the principles of techniques such as High-Performance Liquid Chromatography (HPLC) and Gas Chromatography (GC) to accurately interpret analytical results. Additionally, they should be familiar with the operation of Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) to properly understand their application for determining metal and trace element concentrations in wood materials.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	- Oral exam: a) Examination questions on the topics covered in the course and laboratories - 30 minutes per student
Evaluation Criteria	Assessment PASS/FAIL. In the exam, the clarity of the answers, mastery of subject-specific language, ability to synthesize information, judgment, and the ability to make connections to the topics covered and independently summarize topics will be assessed. Additionally, the understanding of the laboratory exercises will be evaluated.
Required Readings	Slides

Supplementary Readings	Literature will be shared.
Further Information	
Sustainable Development Goals (SDGs)	Affordable and clean energy, Industry, innovation and infrastructure, Life on land, Climate action, Sustainable cities and communities