Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Sensors and Biosensors for agri-food applications
Course code	44753
Scientific sector	ING-INF/01
Degree	Master in Food Sciences for Innovation and Authenticity
Semester	1st
Year	II
Academic year	2024/25
Credits	6
Modular	No

Total lecturing hours	30
Total exercise hours	30
Attendance	Preferrable
Prerequisites	General notions of basic chemistry and physics
Course page	

Specific educational objectives	The course aim is to provide the attendants theoretical and practical fundamentals of the operation principles of sensors. Particular emphasis will be devoted to chemical, physical and biosensors used in food technology and agriculture. The aim of the course is to offer a general overview of scientific contents combined with specific professional skills and knowledge. In addition, the student will acquire soft skills connected to scientific presentations or reports, as well as practical skills related to sensor use and implementation.

Lecturer	Prof. Luisa Petti, e-mail: Luisa.Petti@unibz.it https://www.unibz.it/it/faculties/engineering/academic-staff/person/39580-luisa-petti
Office hours	After consultation and agreement with lecturers
Lecturer (exercise hours)	Dr. Manuela Ciocca, e-mail: Manuela.Ciocca@unibz.it https://www.unibz.it/it/faculties/engineering/academic-staff/person/44873-manuela-ciocca
Office hours	After consultation and agreement with lecturers
Teaching language	English
List of topics covered	1. Sensor materials and technologies 2. Basics of sensors and measurement techniques 3. Overview and operational principles of chemical, optical, physical and biosensors 4. Applications of sensor systems to food science and agriculture 5. Outlook in future sensor technologies
Teaching format	The hours are divided in: • Presentations and theoretical classroom lessons, • Exercises and laboratory sessions.

	The material (lecture notes, presentations, videos, reading and learning materials…) for lectures, exercises and labs will be provided by the lecturer and will be available before the lecture.

Learning outcomes	The learning outcomes referred to the Dublin Descriptors are: Knowledge and understanding of how sensors work, of the advantages/disadvantage of competing technologies and of the potential application fields. Applying knowledge and understanding in scientific and professional environments. Making judgments when assessing different solutions for a given scientific or technical problem on the basis of performance and on the trade-off with cost. Communication skills in presenting scientific results in written and oral form, in particular using an appropriate English language. Learning skills concerning the ability to find information on the web and assess their validity, to use and transmit the technical knowledge acquired in the course.

Assessment	The assessment is carried out via an oral examination aimed to check the knowledge, presentation skills and practical know-how acquired in the course. The oral part consists of a scientific presentation (using power point) on a given topic to be prepared individually during exercise hours under the supervision of the lecturer and at home, followed by specific questions on the course and the laboratory topics.
Assessment language	English
Evaluation criteria and criteria for awarding marks	The criteria for the assessments are clarity of answers, mastery of oral presentations (also with respect to the teaching language), depth of the acquired knowledge, as well as skills in critical thinking.

Required readings	Materials provided by lecturers
Supplementary readings	Materials provided by lecturers