Syllabus

Course Description

Course Title	Computer application in food sciences
Course Code	44741
Course Title Additional	
Scientific-Disciplinary Sector	NN
Language	English
Degree Course	Master in Food Sciences for Innovation and Authenticity
Other Degree Courses (Loaned)	
Lecturers	Prof. Matteo Mario Scampicchio, matteo.scampicchio@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/30226
Teaching Assistant	
Semester	First semester
Course Year/s	1st
CP	3
Teaching Hours	18
Lab Hours	12
Individual Study Hours	45
Planned Office Hours	9
Contents Summary	1. Data Analysis 2. Statistical analysis 3. Spreadsheet Competency 4. Food Process Optimization 5. Quality Control
Course Topics	The course aims to analyze experimental data in food sciences using Excel and Google Sheets. By the end of the course, students should be able to: 1. Summarize datasets with graphics

	2. Control charts for food process control 3. Process capability and Six Sigma 4. Regression and calibration
Keywords	Descriptive Statistics Hypothesis Testing Statistical Process Control (SPC) Control Charts Process Capability Uncertainty Regression
Recommended Prerequisites	The course does not require any programming experience. However, the following prior knowledge is recommended to facilitate learning: 1. Basic Math: familiarity with mean, standard deviation, and simple probability concepts. 2. Basic Computer Skill: manage files (open, save, close), perform basic commands (copy and paste).
Propaedeutic Courses	None
Teaching Format	The course combines lectures and hands-on exercises using Excel and Google Sheets.
Mandatory Attendance	No
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding: Knowledge of analytical methods for determining the authenticity, functionality, and microbiological safety of food products, as well as the related methodological tools for risk assessment. These knowledge areas will be developed through an educational program that integrates theoretical teaching activities with practical activities, such as laboratory exercises, computer simulations, simulations of food processes using pilot plants, and company visits. Ability to apply knowledge and understanding: Ability to solve problems related to the organization of production, logistics, and management of agri-food chains. Making judgements: Independent judgement is developed through a training programme designed to stimulate critical analysis in students. This

	includes the use of case studies, simulations using spreadsheets and videos, the reading and critical discussion of scientific articles, as well as specialist seminars held by experts in the food sector. The assessment of the independent judgement acquired by students is entrusted to the individual teachers responsible for the training activities, who will assess it through oral and/or written reports on specific topics and/or through exams. Communication skills: Use of the English language, both written and spoken, at a B2 level, with a command of technical and scientific vocabulary related to food science. Structure and draft scientific and technical documentation describing project activities; Prepare and present technical reports in English on specialist topics. Learning skills: The degree course provides graduates with the cognitive skills, logical tools and familiarity with new information technologies necessary to ensure continuous updating of knowledge, both in their specific professional field and in the field of scientific research.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	The final evaluation consists of a written multiple-choice quiz focused on interpreting technical outputs (histograms, control charts, ANOVA tables, box plots).
Evaluation Criteria	The final evaluation will be based on a multiple-choice written quiz. Passing criteria: pass with at least 18/30.
Required Readings	**Handouts provided by the Lecturer**
Supplementary Readings	Brand, W. (2014). *Statistics for Dummies* (2nd ed.). Wiley. Very accessible introduction to descriptive statistics, hypothesis testing, and ANOVA.

	Montgomery, D.C. (2019). *Introduction to Statistical Quality Control* (8th ed.). Wiley. Core chapters on control charts, process capability, and statistical process control (SPC). Miller, J.N., & Miller, J.C. (2018). *Statistics and Chemometrics for Analytical Chemistry* (7th ed.). Pearson. Essential for hypothesis testing, ANOVA, regression, calibration, and uncertainty evaluation.
Further Information	
Sustainable Development Goals (SDGs)	Quality education, Gender equality, Reduced inequalities, Industry, innovation and infrastructure, Decent work and economic growth