

General Information	
Academic subject	Advanced Microbiological Methods (I.C. Methodologies for Food Quality)
Degree course	Master programme: Food Science and Technology
ECTS credits	3
Compulsory attendance	No
Teaching language	Italiano

Subject teacher	Name Surname	Mail address	SSD
	Maria Calasso	maria.calasso@uniba.it	AGR/16

ECTS credits details		
Basic teaching activities	2 ECTS Lectures	1 ECTS Laboratory or field class

Class schedule	
Period	I semester
Course year	first
Type of class	Lecture- workshops

Time management	
Hours	75
In-class study hours	30
Out-of-class study hours	45

Academic calendar	
Class begins	September 27 ^h , 2021
Class ends	January 21 th , 2022

Syllabus	
Prerequisites/requirements	Principles of biochemistry, food microbiology and genetics
Expected learning outcomes	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Knowledge of the main advanced methods applied to monitor the main microbial groups involved in food production <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Knowledge of the main microbiological methods for identification, typing and in situ/ ex situ monitoring of starter, spoilage, and pathogen microorganisms in the food, to guarantee quality and safety during processes of transformation and conservation. ○ Skill for management and control of traceability operations of food industries <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> ○ Correctly advising solutions to assess microbiological properties and quality of foods <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Describing advanced microbiological methods and applications to monitor food quality <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> ○ Updating the knowledge of advanced microbiological methods applied to monitor microbiological food quality <p>The expected learning outcomes, in terms of both knowledge and skills, are provided in Annex A of the Academic Regulations of the Degree in Food Science and Technology (expressed through the European Descriptors of the qualification)</p>

Contents	<ul style="list-style-type: none"> • Microbial starters for main food fermentations; spoilage and pathogen microorganisms • Culture-dependent techniques • Microbial identification by phenotypic methods • Microbial identification by genotypic methods • Nucleic Acid Extraction and Purification • Polymerase chain reaction • Electrophoresis • Genic amplification • Species Specific Identification • Sequencing of 16S rRNA Gene • Amplified Ribosomal DNA Restriction Analysis • PCR Restriction Analysis • Southern Blot • Fluorescent In Situ Hybridization • Microbial Typing • PFGE (Pulsed Field Gel Electrophoresis) • RAPD (Random Amplified Polymorphic DNA) • repPCR (Repetitive Element Sequence Based PCR) • Polyphasic Approach • Culture-independent techniques • Microbial community dynamics • Real time PCR • Next generation sequencing • Metagenomics • Case studies
Course program	
Reference books	<ul style="list-style-type: none"> • Lecture notes and educational supplies provided during the course • Lecture notes and educational supplies will be provided by means of online platforms (i.e.: Edmodo) • Scientific reviews. • Persing et Al. MOLECULAR MICROBIOLOGY Diagnostic Principles and Practice 2 nd Ed • Introduction to Bioinformatics in Microbiology; Editors: Christensen, Henrik, 2018, Springer • Brock; Madigan; Martinko. Brock BiologiadeiMicroorganismi 1, 2. Casa Editrice Ambrosiana (2007). • Gobbetti M. e Corsetti A. Biotecnologiedeiprodottilevitati da forno. Casa Editrice Ambrosiana (2010). • Simonetti, Simonetti e D’Auria. Elementi di Tecniche Microbiologiche, Edizioni Mediche Scientifiche Internazionali (2001).
Notes	
Teaching methods	<p>Lectures will be presented through PC assisted tools (PowerPoint, video). Field and laboratory classes, reading of regulations, case studies will be experienced.</p> <p>Lecture notes and educational supplies will be provided by means of online platforms (i.e.: Edmodo, Google Drive etc.)</p>
Evaluation methods	<p>The exam consists of an oral dissertation on the topics developed during the theoretical and theoretical-practical lectures in the classroom and in the laboratory/production plants, as reported in the Academic Regulations for the Master Degree in Food Science and Technology (article 9) and in the study plan (Annex A).</p> <p>Students attending at the lectures may have a middle-term preliminary exam, consisting of a written test, relative to the first part</p>

	<p>of the program, which will concur to the final evaluation and will be considered valid for a year.</p> <p>The evaluation of the preparation of the student occurs on the basis of established criteria, as detailed in Annex B of the Academic Regulations for the Master Degree in Food Science and Technology.</p> <p>Non-Italian students may be examined in English language, according to the aforesaid procedures.</p>
Evaluation criteria	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Describing the main advanced methods applied to monitor the main microbial groups involved in food production <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Describing the main microbiological methods for identification, typing and in situ/ ex situ monitoring of starter, spoilage, and pathogen microorganisms in the food, to guarantee quality and safety during processes of transformation and conservation. ○ Describing the management and control of traceability operations of food industries <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> ○ Expressing reasonable hypotheses about solutions to assess microbiological properties and quality of foods <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Describing advanced microbiological methods and applications to monitor food quality <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> ○ Expressing reasonable hypotheses about the application of advanced microbiological methods to monitor microbiological food quality
Receiving times	Visiting hours: from Monday to Thursday 9.00 a.m. – 17.30 p.m. by appointment only