

<b>General Information</b>	<b>BACELOR DEGREE IN BIOTECHONOLOGIES</b>
Title of the subject	Food Microbiology
Degree Course (class)	Industrial and Agri-food Biotechnologies (L-2)
ECTS credits	6
Compulsory attendance	Yes
Language	Italian
Academic year	2020/2021

<b>Subject Teacher</b>		
Name and Surname	Pasquale Filannino	
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Place and time of reception	Online reception via TEAMS platform after request by email	
<b>ECTS credits details</b>	Discipline sector (SSD)	Area
	AGR/16	---

<b>Study plan schedule</b>	Year of study plan	Semester
	Third	Second

<b>Time management</b>	Lessons	Laboratory	Exercises	Total
CFU	5	1	0	6
Total hours	125	25	0	150
In-class study hours	40	12	0	52
Out-of-class study hours	85	13	0	98

### **Syllabus**

Prerequisites / Requirements	Knowledge of Biochemistry, General Microbiology, Food Chemistry. Knowledge of the main food technologies and food supply chains.
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#### **Expected learning outcomes (according to Dublin descriptors)**

Knowledge and understanding	Understanding and elaboration of knowledges inherent to the microbial biotechnologies applied to food production
Applying knowledge	Ability to isolate, characterize and select microorganisms with a biotechnological role in the food supply chains.
Making informed judgments and choices	Ability to make a critical evaluation of teaching and research issues related to the microbial biotechnologies field
Communicating knowledge	Acquisition of communication skills and tools, both using Italian and English languages, aimed at exchanging ideas, information, data and methodologies with specialist and non-specialist interlocutors on issues related to food microbiology, focusing on microorganisms with a biotechnological role.
Capacities to continue learning	Ability to deepen and update knowledges regarding the development and application of microbial technologies in food industry.

### **Study Program**

Content	<ul style="list-style-type: none"> <li>• Eco-physiology of microorganisms of biotechnological interest for the food supply chain</li> <li>• Control of microorganisms in biotechnological processes</li> <li>• Selection of microbial starters for the agro-food sector: traditional and molecular approaches</li> <li>• Production of microbial biomass for agro-food production</li> <li>• Microbial dynamics during the fermentation of vegetable matrices</li> <li>• Selection and use of starter cultures for oenology (selection of yeast and malolactic starter bacteria; immobilization of yeasts and bacteria; strategies for the genetic improvement of yeasts)</li> <li>• Culture-dependent and -independent methods applied to starters used for leavened baked products</li> <li>• Study of pro-dairy microbiota and biotechnological implication</li> <li>• Elements of microbiology of meat and meat-derived products</li> <li>• Predictive microbiology: general principles</li> </ul>
Bibliography and textbooks	<ul style="list-style-type: none"> <li>• Lecture notes and educational supplies provided during the course</li> </ul> <p>For more in deep studying:</p> <ul style="list-style-type: none"> <li>• Pubblicazioni su riviste scientifiche consigliate durante il corso</li> <li>• Madigan, M.T., J.M. Martinko, D.A. Stahl, D. Clark. <i>Biologia dei Microrganismi</i>, vol. I – <i>Microbiologia generale</i>. Pearson Italia, 2012.</li> <li>• Farris, G. A., M. Gobbetti, E. Neviani, M. Vincenzini. <i>Microbiologia dei prodotti alimentari</i>. Casa Editrice Ambrosiana. 2012.</li> <li>• Gobbetti, M., A. Corsetti. <i>Biotecnologia dei prodotti lievitati da forno</i>. Casa Editrice Ambrosiana. 2010.</li> <li>• Biavati B. e C. Sorlini. <i>Microbiologia Generale e Agraria – Seconda edizione</i>. Casa Editrice Ambrosiana. 2012.</li> <li>• Gardini, F., &amp; Parente, E. (2013). <i>Manuale di microbiologia predittiva</i>. Italia: Springer-Verlag.</li> </ul>
Notes to textbooks	Further information concerning the books and the scientific articles may be provided by the teacher.
Teaching methods	<ul style="list-style-type: none"> <li>- Frontal lessons with Power Point support</li> <li>- Laboratory activities</li> <li>- Virtual laboratory activities with Power Point and commented videos</li> </ul>
Assessment methods (oral, written, ongoing assessment)	<ul style="list-style-type: none"> <li>- The exam consists of an oral dissertation on the topics developed during the theoretical and theoretical-practical lectures.</li> <li>- Attending students may have a middle-term preliminary exam, consisting of a written test, relative to the first part of the program, which will concur to the final evaluation and will be considered valid for a year.</li> </ul>
Evaluation criteria (describe criteria for each of the above expected outcomes)	<p><b>Knowledge and understanding:</b> describing analytically and, if necessary, synthetically, the issues related to food microbiology aimed to improve food productions, focusing on the biotechnological role of microorganisms.</p> <p><b>Applying knowledge and understanding:</b> describing protocols to isolate, characterize and select useful microorganisms for food supply chains and to apply them in fermentation processes.</p> <p>Making informed judgements and choices: describing how to improve food quality through the application of pro-technological microorganisms</p> <p><b>Communicating knowledge and understanding:</b> communicating the theoretical concepts acquired using the appropriate scientific language and the specific lexicon of this subject; describing, also by</p>

	<p>applicative cases, the practical aspects and potential consequences of this discipline on the research and development and quality control activities in food industry.</p> <p><b>Capacities of continue learning:</b> describing how to finalize own knowledges to solve new problems associated with the application of pro-technological microorganisms in food supply chains</p>
Further information	---