

《食品微生物学》课程教学大纲

课程基本信息 (Course Information)					
课程代码 (Course Code)	FS339	*学时 (Credit Hours)	32	*学分 (Credits)	2
*课程名称 (Course Name)	(中文) 食品微生物学				
	(英文) Food Microbiology				
课程性质 (Course Type)	专业必修课 core course				
授课对象 (Target Audience)	食品科学与工程专业本科生 Undergraduate student majoring in Food Science and Technology				
授课语言 (Language of Instruction)	双语 Bilingual (English and Chinese)				
*开课院系 (School)	农业与生物学院 (School of Agriculture and Biology)				
先修课程 (Prerequisite)	食品化学、食品酶学、生物化学、微生物学 (Food Chemistry, Food Enzymology, Biochemistry and Microbiology)				
授课教师 (Instructor)	史贤明、张建华 (Xianmin Shi, Jianhua Zhang)	课程网址 (Course Webpage)	无 (No webpage)		
*课程简介 (Description)	<p>《食品微生物学》研究与食品品质和安全相关的各种有益和有害微生物的种类、分布及活动规律，阐明它们与食品发酵、食品腐败、食品安全的关系，系统地介绍了食品微生物及其生长、食源性致病微生物致病机理、食品中微生物检测、食品的保藏方法和食品安全管理体系等方面的基本知识。课程对食品中 G⁺和 G⁻致病菌、肉类、海鲜、乳制品、水果、蔬菜等产品中的腐败微生物及发酵果蔬、发酵乳制品、啤酒和葡萄酒类中的主要发酵微生物进行了讨论，并让学生了解传统的微生物培养和鉴定的方法及分子生物学（如指纹识别、PCR 等）和免疫学新方法。同时，对食品加工保藏过程中抑制微生物生长的物理、化学和生物方法及安全性控制的 HACCP 体系也有相应的阐述。《食品微生物学》可以作为食品科学与工程、食品营养和生物系学生的主修课程。</p>				
*课程简介 (Description)	<p>Food Microbiology focuses on a wide variety of microbes that have both beneficial and deleterious effects on the safety and quality of foods. Food microbiology focuses on the general biology of the microorganisms that are found in foods including: their growth characteristics, pathogenesis, identification, fermentation, preservation, and legislation. Specifically, areas of interest which concern food microbiology are G⁺ and G⁻ pathogens in food product, microbiological aspects of spoilage and quality in meat, seafood, dairy, fruit and vegetable, as well as the microorganisms in charge of fruit, vegetable, dairy and wine fermentation. Traditional culture methods and modern molecular and immunological methods for detection, identification and enumeration of food microorganisms are discussed. Physical, chemical and biological methods for</p>				

	inhibiting the growth of spoilage microorganism during food process and storage, and HACCP system are also described. Food Microbiology can be a core course for students who major in food science and technology, food nutrition or biology.
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课程教学大纲 (Course Syllabus)

*学习目标(Learning Outcomes)	<p>1. 了解并认识微生物活动规律与产品安全、质量的关系; A3</p> <p>2. 了解食品发酵、腐败和安全中的主要微生物学问题; A3, A5.2.1</p> <p>3. 认识并掌握食品中微生物的检测、鉴定和控制方法。A5.1.1, A5.1.3</p> <p>1. Students will understand the relationship between the microorganism activity and food safety and food quality. A3</p> <p>2. Students will understand the main issues in connection with food fermentation, food spoilage and food safety. A3, A5.2.1</p> <p>3. Provide students with multiple methods for detecting, identifying and control microorganism in food. A5.1.1, A5.1.3</p>
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*教学内容 进度安排及要求 (Class Schedule & Requirements)	教学内容	学时	教学方式	作业及要求	基本要求	考查方式
	绪论 Introduction	2	讲授 lecture		了解食品微生物学的主要研究内容, 当前的食品加工措施, 食品微生物学的理论和应用 Introduction Food handling practices Microbiological theory for food industries Microbiological application for food industries	
	影响食品微生物生长的因素 Factors That Influence Microbes in Foods	2	讲授 lecture		掌握微生物的最适生长条件 The optimal growth conditions for microorganisms	
	孢子及其重要性 Spores and Their Significance	2	讲授 lecture	作业 Home work 1	掌握孢子的耐热性与杀菌条件的关系 The relationship between the heat resistance and the sterilizing conditions of spores	
	食品微生物的检测及计数方法 Detection and Enumeration of	2	讲授 lecture		掌握食品微生物的检测及计数方法的原理及应用 Principle and application of detection and enumeration	

Microbes in Food				
微生物指示菌类和微生物标准 Indicator Microorganisms and Microbiological Criteria	2	讲授 lecture		了解微生物标准的重要性，掌握标准的要求 The importance and requirements of microbiological criterion
食品中主要的 G+ 致病微生物及其致病机理 Gram-positive Foodborne Pathogenic Bacteria	4	讲授 lecture		掌握主要食源性致病微生物的传播途径、致病机理及其预防措施 Foodborne pathogens: Characteristics of Disease and specific foods, symptoms and Treatment, preventative Measures
食品中主要的 G- 致病微生物及其致病机理 Gram-Negative Foodborne Pathogenic Bacteria	4	讲授 lecture	作业 Home work 2	
乳及乳制品中腐败微生物 spoilage microorganisms in milk and dairy products	2	讲授 lecture		掌握不同食品中主要腐败的特性及其对食品品质的影响 Characteristics of the spoilage Organisms and their effects on food quality
果蔬及其制品中腐败微生物 spoilage microorganisms in fruits, vegetables and their products	2	讲授 lecture		
禽畜制品和水产品中腐败微生物 spoilage microorganisms in poultry, Livestock and aquatic products	2	讲授 lecture		

	发酵乳制品和发酵果蔬产品 microorganisms in fermented dairy product and Fermented fruit and vegetable products	2	讲授 lecture		掌握不同食品中主要发酵微生物的特性及其对食品品质的影响 Characteristics of the fermentation organisms and their effects on food quality	
	化学抑菌剂 Chemical antimicrobials	2	讲授 lecture	作业 Home work 3	掌握不同保藏方法的原理，以及不同化学防腐剂的抑菌机理。 Principle of different preserving methods, how chemical preservatives can prevent food spoilage	
	物理和生物法 Physical and biological method for inhibiting the growth of spoilage microorganism	2	讲授 lecture		掌握不同的杀菌方法或保藏方法的适用性。 Applicability of different sterilization or preservation methods	
	工业控制体系 Industrial control system	2	讲授 lecture		掌握食品安全的微生物指标，了解其控制体系和方法 Food microbiological criterion, food Safety Management tools	
*考核方式 (Grading)	考试 (60%) 作业与课堂讨论 (40%) Exam (60%) Homeworks and discussion (40%)					
*教材或参考资料 (Textbooks & Other Materials)	教材： 食品微生物学导论，主编 Thomas J. Montville and Karl R. Matthews. 第一主编非我校教师，科学出版社，2011.7（原著第二版），ISBN 9787030307613，6 届，外文教材，不是国家级规划教材。 参考资料： 现代微生物学，刘志恒，科学出版社，2012 现代食品微生物学，James M. Jay, Martin J. Loessner, David A. Golden 著，何国庆，丁立孝，宫春波译，中国轻工业出版社，2008 Modern Food Microbiology, James M. Jay, Martin J. Loessner, David A. Golden, translated by Guoqing He, Lixiao Ding and Chunbo Gong, China Light Industry Press, 2008					
其它 (More)						
备注 (Notes)						

备注说明：

1. 带*内容为必填项。
2. 课程简介字数为 300-500 字；课程大纲以表述清楚教学安排为宜，字数不限。