

<b>Food Science Option</b>		<b>Legend:</b>		<i>3= covered extensively; 2=covered moderately; 1=covered to some extent</i>												
<b>Content</b>	<b>Learning Outcomes</b>	<b>Freshman classes</b>		<b>Sophomore classes</b>		<b>Junior classes</b>					<b>Senior classes</b>					
		FDSC 1101	FDSC 1102	FDSC 2000	FDSC 2100	FDSC 3210	FDSC 3940	FDSC 3950	FDSC 4170	FDSC 4190	FDSC 4100	FDSC 4180	FDSC 4230	FDSC 4000	FDSC 3960	FDSC 4250
<b>General Success Skills</b>																
Communication skills (i.e., oral, written communication, listening, and interviewing, etc)	Demonstrate the use of oral and written communication skills. This includes: writing technical reports, letters, and memos; communicating technical information to a nontechnical audience; and making formal and informal presentations.	1	2		3		2	3	3	3	3	2	1	1	1	3
Critical-thinking/problem solving skills (i.e., creativity, resourcefulness, scientific reasoning, analytical thinking, etc.)	Define a problem, identify potential causes and possible solutions, and make thoughtful recommendations.	1	2	2	1	3	2	3	3	3	3		3		2	3
	Apply critical thinking skills to new situations.	1	2	1		1	2	3	3	2	2	1	3	1	3	2
Professionalism skills (i.e., ethics, integrity, respect for diversity).	Commit to the highest standards of professional integrity and ethical values.		3				1		3		1	1	1		1	2
	Work and /or interact with individuals from diverse cultures.		3						1	1	1		1		1	1
Life Long Learning Skills	Explain the skills necessary to continually educate oneself.		3			1	1		1	1			1		1	1
Interaction Skills (i.e., teamwork, mentoring, leadership, networking, interpersonal skills, etc.)	Work effectively with others.	1	3		3	2	2	3		1	3		2		2	3
	Provide leadership in a variety of situations.	1	3				2	1		1					1	1
	Deal with individual and/ or group conflict.	1	2		1		1	1		1	1					
Information acquisition skills (i.e., written and electronic searches, databases, Internet, etc)	Independently research scientific, and nonscientific information.	1	2	1	2		3	3	3	2	2	1		1	1	2
	Competently use library resources.	1		1	3		2	3	3	2	1	1	1	1	2	2
Organizational skills (i.e., time management, project management, etc.)	Manage time effectively.	1	1		3		1	3	1	2			1		1	2
	Facilitate group projects.	1	3		2		2	3		2	3				2	2
	Handle multiple tasks and pressures.	1	1		2		2	2		2	2					1
<b>Food Chemistry and Analysis</b>																
Structure and properties of food components including water, carbohydrates, protein, lipids, other nutrients, and food additives.	Understand the chemistry underlying the properties and reactions of various food components.			3	2	1			3	3		3	1			2
Chemistry of changes occurring during processing, storage, and utilization.	Have sufficient knowledge of food chemistry to control reactions in foods.			1	1				3	3		3	2			2
	Understand the major chemical reactions that limit shelf life of foods.			2	1				3	3		3				2

	Be able to use the laboratory techniques common to basic and applied food chemistry.				3					3		1				1	
Principles, methods, and techniques of qualitative and quantitative physical, chemical, and biological analysis of food and food	Understand the principles behind analytical technique when presented with a practical problem.				3				1	1		1				1	
	Demonstrate practical proficiency in a food analysis laboratory.				3					1							
<b>Food Safety and Microbiology</b>																	
Pathogenic and spoilage microorganisms in foods.	Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they grow.	1			3			3	3					1		2	1
	Identify the conditions under which the important pathogens are inactivated, killed, or made harmless in foods.				3			2	3	2				2		2	1
	Utilize laboratory techniques to identify microorganisms in foods.							1	3								
Beneficial microorganisms in food systems.	Understand the principles involving food preservation via fermentation processes.	1			2			2	2			2				1	2
Influence of the food system on the growth and survival of microorganisms.	Understand the role and significance of microbial inactivation, adaptation, and environmental factors (I.e.,aw, pH, temperature) on growth and response of microorganisms in various environments.				2			2	2					2		2	1
Control of microorganisms.	Be able to identify the conditions, including sanitation practices, under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods.	1			2	1		1	2					2		3	2
<b>Food Processing and Engineering</b>																	
Characteristics of raw food material.	Understand the source and variability of raw food material and their impact on food processing operations.				1	2					1			3	2		3
Principles of food preservation, including low and high temperatures, water activity, etc.	Know the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage.				3									3	3		2
	Understand the principles that make a food safe for consumption.				3		2							1	3		2
Engineering principles, including mass and energy balances, thermodynamics, fluid flow, and heat and mass transfer.	Understand the transport processes and unit operations in food processing as demonstrated both conceptually and in practical laboratory settings.	1						3							2		3
	Be able to use the mass and energy balances for a given food process.							1							3		3

	Understand the unit operations required to produce a given food product.			1		1							2			3
Principles of food processing techniques, such as freeze drying, high pressure, aseptic processing, extrusion, etc.	Understand the principles and current practices of processing techniques and the effects of processing parameters on product quality.	1		3	1	2			1				3	1		3
Packaging materials and methods.	Understand the properties and uses of various packaging materials.			1		1								2		2
Cleaning and sanitation.	Understand the basic principles of and practices of cleaning and sanitation in food processing operations.			1											3	2
Water and waste management.	Understand the requirements for water utilization and waste management in food and food processing.				1						1		1	1		1
<b>Applied Food Science</b>																
Integration and application of food science principles (food chemistry, microbiology,	Be able to apply and incorporate the principles of food science in practical real-world situations and problems.				2	2	1	1	3	3	2	3	3		3	3
Computer skills	Know how to use computers to solve food science problems.				2	3					2		1			1
Statistical Skills	Be able to apply statistical principles to food science applications.				1						3					
Quality Assurance	Be able to apply the principles of food science to control and assure the quality of food products.			1	3			3			2	2	3	2	2	2
Analytical and affective methods of assessing sensory properties of food utilizing statistical methods.	Understand the principles of sensory analysis.			1						1	3					1
Current issues in food science.	Be aware of current topics of importance to the food industry.	2		2	2		1	3	2	1	2	1		3	1	2
Food laws and regulations.	Understand the government regulations required for the manufacture and sale of food products.	2		2	2	1	1	1	2		1	1	2	2	2	1

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