

Colorado AFNR Course Scope and Sequence

Course Name	Principles of Food Science		Course Details	Level 2 course following Introduction to Agriculture A & B in the Food Science pathway.		
			Course = 0.50 Carnegie Unit Credit			
Course Description	Students will apply principles of nutrition, biology, chemistry, and human behavior to the food we eat every day. Refine skills in measurement, following recipes, interpreting food labels and identifying safe storage and processing techniques.					
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.					
SCED Identification #	18305	Schedule calculation based on 60% of a semester instructional time. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.				
All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at https://www.cde.state.co.us/standardsandinstruction/essentialskills						
Unit Number, Title and Brief Description	Suggested % of Instructional Time	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration	
Unit 1: Food Supply and Need, Value-Added Production Cycle	5%	FPP.04. Explain the scope of the food industry and the historical and current developments of food product and processing.	FPP.04.02 Evaluate the significance and implications of changes and trends in the food products and processing industry in the local and global food systems.	FPP.04.02.01.a Describe and explain the components of the food products and processing industry (e.g. processing, distribution, byproducts, etc)	Food Consumption & Waste Notes Nutritious Insects Activity	
Unit 2: Careers in the food products and processing sector	5%	CS.05 Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food, and Natural Resources career pathway.	CS.05.01 Evaluate and implement the steps and requirements to pursue a career opportunity in each of the AFNR career pathways (e.g. goals, degrees, certifications, resumes, cover letter, portfolio, interviews, etc)	CS.05.01.01.b Create a personal plan outlining goals and steps to obtain a career in an AFNR pathway. CS.05.01.02.b Analyze personal skillset and create a plan for obtaining the required education, training, and experiences		

			CS.05.02 Examine and choose career opportunities that are matched to personal skills, talents, and career goals in an AFNR pathway of interest.	to obtain a career in AFNR pathway. CS.05.01.03.b Assess personal goals, experiences, education, and skillsets and organize them to produce the appropriate tools and develop the skills to effectively communicate about one's qualification for an AFNR career. CS.05.02.02.a Research and describe careers in each of the AFNR pathways and choose potential careers connecting to personal interests and skills.	
Unit 3: Food Preparation and Tools	5%	FPP.03 Select and process food products for storage, distribution, and consumption.	FPP.03.02 Design and apply techniques of food processing, preservation, packaging, and presentation for distribution and consumption of food products.	FPP.03.02.01.a Identify and explain English and metric measurements used in the food products and processing industry	
Unit 4: pH in Nutrition and Food	3%	FPP.03 Select and process food products for storage, distribution, and consumption.	FPP.03.02 Design and apply techniques of food processing, preservation, packaging, and presentation for distribution and consumption of food products.	FPP.03.02.03.b Analyze and document food preservation processes and methods on a variety of food products.	
Unit 5: Food Chemistry Study, lab, and quiz for each	21%	FPP.02 Apply principles of nutrition, biology, microbiology, chemistry, and human behavior to the	FPP.02.02 Apply principles of microbiology and chemistry to develop food products to provide a safe,	FPP.02.02.01.a Examine and describe the basic chemical makeup of different types of food.	

nutrient (carbohydrates, lipids, proteins, water, vitamins, and minerals)		development of food products.	wholesome, and nutritious food supply for local and global food systems.	FPPS.02.02.01.b Explain how the chemical and physical properties of foods influence nutritional value and eating quality. FPPS.02.02.01.c Design and conduct experiments to determine the chemical and physical properties of food products.	
Unit 6: Food Preservation • Canning • Pressure Cooking • Dehydration	5%	FPP.03 Select and process food products for storage, distribution, and consumption.	FPP.03.02 Design and apply techniques of food processing, preservation, packaging, and presentation for distribution and consumption of food products.	FPP.03.02.03.a Identify methods of food preservation and give examples of food preserved by each method FPP.03.02.03.b Analyze and document food preservation processes and methods on a variety of food products.	
Unit 7: Food Physics • Study of yeast, baking power, soda, emulsions, Maillard reaction	7%	FPP.02 Apply principles of nutrition, biology, microbiology, chemistry, and human behavior to the development of food products.	FPP.02.02 Apply principles of microbiology and chemistry to develop food products to provide a safe, wholesome, and nutritious food supply for local and global food systems.	FPP.02.02.01.b Explain how the chemical and physical properties of food influence nutritional value and eating quality. FPP.02.02.02.a Identify common food additive and identify their properties (e.g. preservatives, antioxidants, buffers, stabilizers, colors, flavors, etc) FPP.02.02.02.b Describe the purpose of common food additives and how they influence the chemistry of food.	

Unit 8: Meat Science - Quality grades - Retail cuts	5%	FPP.03 Select and process food products for storage, distribution, and consumption.	FPP.03.01 Implement selection, evaluation, and inspection techniques to ensure safe and quality food products.	FPP.03.01.01.c Outline procedures to assign quality and yield grades to food products according to industry standards.	
Unit 9: Food Safety & Bioterrorism	5%	FPP.01 Develop and implement procedures to ensure safety, sanitation and quality in food products and processing facilities.	FPP.01.02 Apply food safety and sanitation procedures in the handling and processing of food products to ensure food quality.	FPP.01.02.01.c Identify sources of contamination in food products and/or processing facilities and develop ways to eliminate contamination. FPP.01.02.04.a Describe the effects of food borne pathogens have on food products and humans.	

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

[CO CTE Academic Standards Resources](#) (Rubrics, integration strategies, etc)

[CDE Colorado Academic Standards Online](#) (Online standards lookup tool)

Standard 1: Oral Expression and Listening

Prepared Graduate 1: *Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.*

Students collaborate during food science laboratories, food preservation activities, food safety investigations, chemistry experiments, and product evaluations to solve problems, interpret results, and apply safe food handling and processing practices.

Standard 2: Reading for All Purposes

Prepared Graduate 4: *Read a wide range of informational texts to build knowledge and to better understand the human experience.*

Students analyze food labels, processing methods, nutrition information, food chemistry resources, food safety regulations, preservation techniques, meat grading standards, and career information to understand food products and processing systems.

Prepared Graduate 5: *Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.*

Students develop and apply specialized vocabulary related to nutrition, microbiology, chemistry, food preservation, food additives, pH, food safety, contamination, meat grading, and food processing to communicate effectively in food science settings.

Standard 3: Writing and Composition

Prepared Graduate 7: *Craft informational/explanatory texts using techniques specific to the genre.*

Students document food preservation processes, laboratory investigations, food chemistry experiments, food safety procedures, and product evaluations while explaining how biological, chemical, and physical principles influence food quality and safety.

Standard 4: Research Inquiry and Design

Prepared Graduate 10: *Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.*

Students research food industry trends, nutrition, food chemistry, preservation methods, food additives, food safety practices, meat quality standards, and careers in food science to evaluate food products and develop safe, nutritious, and high-quality food processing solutions.

Note: *Mathematics and Science standards will be added in the future. Visit the [Colorado Academic Standards](#) page for the most current version.*