

Agriculture, Food and Natural Resources: Food Products and Processing Systems Career Pathway Plan of Study for ▶ Learners ▶ Parents ▶ Counselors ▶ Teachers/Faculty

This Career Pathway Plan of Study (based on the Food Products and Processing Systems Pathway of the Agriculture, Food and Natural Resources Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals.

*This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Food Products and Processing Systems Pathway	SAMPLE Occupations Relating to This Pathway
<i>Interest Inventory Administered and Plan of Study Initiated for all Learners</i>								
SECONDARY	9	English/ Language Arts I	Algebra I	Earth or Environmental Science	State History Civics	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Supervised Agricultural Experience (SAE) and participation in appropriate FFA activities support and reinforce classroom and laboratory learning and should be a requirement for all students.	<ul style="list-style-type: none"> • Introduction to Agriculture, Food and Natural Resources 	Occupations Requiring Postsecondary Education <ul style="list-style-type: none"> ▶ Agricultural Communications Specialist ▶ Agricultural Salesperson ▶ Food and Drug Inspector ▶ Food Meal Supervisor ▶ Food Processor ▶ Meat Cutter-Meat Grader ▶ Meat Processor ▶ Produce Buyer
	10	English/ Language Arts II	Geometry	Biology	U.S. History		<ul style="list-style-type: none"> • Introduction to Food Products and Processing Systems 	
	11	English/ Language Arts III	Algebra II or other math course	Chemistry or other science course	World History		<ul style="list-style-type: none"> • Advanced Food Products and Processing Systems 	
	<i>College Placement Assessments-Academic/Career Advisement Provided</i>							
12	English/ Language Arts IV	Trigonometry or other math course	Physics or other science course			<ul style="list-style-type: none"> • Agricultural Economics • Internship in Food Products and Food Processing Systems 		
<i>Articulation/Dual Credit Transcribed-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.</i>								
POSTSECONDARY	Year 13	English Composition	Algebra	Chemistry	American Government	All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include.	<ul style="list-style-type: none"> • Food and the Consumer • Scientific Study of Food Products and Processing Systems 	Occupations Requiring Baccalaureate Degree <ul style="list-style-type: none"> ▶ Agricultural Educator ▶ Bacteriologist ▶ Biochemist-Nutritionist ▶ Bioengineer ▶ Dietician ▶ Food and Fiber Engineer ▶ Food Scientist ▶ Meat Science Researcher ▶ Microbiologist ▶ Quality Control Specialist
	Year 14	Technical Writing	Calculus	Biological Science Botany	American History Geography		<ul style="list-style-type: none"> • Principles of Food Processing • Food Product Development • Food Laws, Regulations and Regulatory Processes 	
	Year 15	Speech/ Oral Communication	Statistics	Biochemistry Microbiology	Political Science		<ul style="list-style-type: none"> • Continue Courses in the Area of Specialization 	
	Year 16	Continue courses in the area of specialization.						

Creating Your Institution's Own Instructional Plan of Study

With a team of partners (secondary/postsecondary teachers and faculty, counselors, business/industry representatives, instructional leaders, and administrators), use the following steps to develop your own scope and sequence of career and technical courses as well as degree major courses for your institution's plan of study.

- 1** Crosswalk the Cluster Foundation Knowledge and Skills (available at <http://www.careerclusters.org/goto.cfm?id=82>) to the content of your existing secondary and postsecondary programs/courses.
- 2** Crosswalk the Pathway Knowledge and Skills (available at <http://www.careerclusters.org/goto.cfm?id=1>) to the content of your existing secondary/postsecondary programs and courses.
- 3** Based on the crosswalks in steps 1 and 2, determine which existing programs/courses would adequately align to (cover) the knowledge and skills. These programs/courses would be revised to tighten up any alignment weaknesses and would become a part of a sequence of courses to address this pathway.
- 4** Based on the crosswalks in steps 1 and 2, determine what new courses need to be added to address any alignment weaknesses.
- 5** Sequence the **content** and **learner outcomes** of the existing programs/courses identified in step 3 and new courses identified in step 4 into a course sequence leading to preparation for all occupations within this pathway. (See list of occupations on page 1 of this document.)
- 6** The goal of this process would be a series of courses and their descriptions. The names of these courses would be inserted into the *Career and Technical Courses* column on the Plan of Study on page 1 of this document.
- 7** Below is a **sample result** of steps 1-6, and these course titles are inserted into the Plan of Study on page 1 of this document.
- 8** Crosswalk your state academic standards and applicable national standards (e.g., for mathematics, science, history, language arts, etc.) to the sequence of courses formulated in step 6.

Agriculture, Food and Natural Resources: Food Products and Processing Systems

SAMPLE Sequence of Courses for ► Instructional Leaders ► Administrators ► Counselors ► Teachers/Faculty

SAMPLE

Below are suggested courses that could result from steps 1-6 above. However, as an educational institution, course titles, descriptions and the sequence will be your own. This is a good model of courses for you to use as an example and to help you jump-start your process. Course content may be taught as concepts within other courses, or as modules or units of instruction.

The following course is based on the Cluster Foundation Knowledge and Skills found at <http://www.careerclusters.org/goto.cfm?id=82>. These skills are reinforced through Supervised Agricultural Experience (SAE) programs including entrepreneurial, work-based, research or service learning. Skills are also reinforced and the SAE supported through participation in appropriate FFA activities.

#1

Introduction to Agriculture, Food and Natural Resources: This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food and natural resources careers and Cluster Foundation Knowledge and Skills. This may be taught as a career exploration course in conjunction with other foundation Career Cluster courses.

The following course is based on the Cluster Foundation Knowledge and Skills as well as the Pathway Knowledge and Skills found at <http://www.careerclusters.org/goto.cfm?id=1>. These skills are reinforced through participation in FFA.

#2

Introduction to Food Products and Food Processing Systems: This course introduces students to the principles, applications and science of food and food processing and production. Students will learn the scientific principles and practice scientific and practical consumer applications involved in the food industry including food science, food processing, microbiology, toxicology, regulations concerning the safety and protection of the food supply and organic production of food and nutrition.

The following courses expose students to Pathway Knowledge and Skills found at <http://www.careerclusters.org/goto.cfm?id=1> and should include an appropriate Supervised Agricultural Experience (SAE) and FFA activities that support classroom/laboratory and SAE learnings.

#3

Advanced Food Products and Processing Systems: Students will apply food science principles to enhance product development with particular emphasis on USDA/FDA standards, nutritional analysis and evaluation of food groups. Students will analyze product preparation options to prepare products for distribution and utilize preservation methods to develop food preservation programs. Work-based learning strategies are used to reinforce content, including but not limited to internships, agriscience projects, apprenticeships and supervised agricultural experience.

#4

Agricultural Economics: This is a course designed to develop skills and knowledge directly related to sales and service, marketing, commodity exchange, supply and demand, and world trade. This course also includes fundamentals of business, economic principles, record keeping, risk management, taxes, legal issues and marketing strategies.

#5

Internship in Food Products and Food Processing Systems: This course is designed for work-site learning experiences that emphasize safety and health in the workplace. Students have the opportunity to practice specific skills, including record keeping, and receive credit for time spent in the workplace.

#6

Food and the Consumer: This course focuses on the food system from point of harvest to the consumption of food by the consumer, including properties of food constituents, protection of food against deterioration and microbial contamination, introduction of foods into the marketplace, processes for making various foods, government regulations, use of food additives and controversial topics related to the food industry.

#7

Scientific Study of Food Products and Processing Systems: This course includes composition and structure of foods, principles and practice of preparation and preservation of standard quality food products, and behavior and interactions of food constituents.

#8

Principles of Food Processing: This course includes biological, physical and chemical principles of food processing as they determine the quality of foods including meat and poultry products, dairy products, fruits and vegetables, grains and bio-engineered foods.

#9

Food Product Development: Content includes principles of developing consumer-packaged food products, including food chemistry, formulation and processing. Also included are process and quality control procedures and their applications to various food systems with development of hazard analysis procedures, specifications, grades and standards.

#10

Food Laws, Regulations and Regulatory Processes: Content includes the history of the development of current state, federal and international food regulations, and guidelines that govern the practice of regulating the wholesomeness of red meats, poultry and eggs.

Notes

A large area of the page is filled with horizontal lines, alternating between light blue and light yellow, intended for taking notes.