

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

This Career Pathway Plan of Study (based on the Power, Structural and Technical 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 Power, Structural and Technical 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.	• Introduction to Agriculture, Food and Natural Resources	Occupations Requiring Postsecondary Education ▶ Communication Technician ▶ Database Administrator ▶ Electronic Systems Technician ▶ Equipment/Parts Manager ▶ GPS Technician ▶ Heavy Equipment Maintenance Technician ▶ Information Lab Specialist ▶ Machine Operator ▶ Machinist ▶ Recycling Technician ▶ Remote Sensing Specialist ▶ Welder
	10	English/ Language Arts II	Geometry	Biology	U.S. History		• Introduction to Power, Structural and Technical Systems	
	11	English/ Language Arts III	Algebra II or other math course	Physics or other science course	World History		• Structural Systems	
	<i>College Placement Assessments-Academic/Career Advisement Provided</i>							
	12	English/ Language Arts IV	Trigonometry or other math course	Chemistry or other science course		• Power Systems • Internship in Power, Structural and Technical 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	Physics 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.	• Power, Structural and Technical Systems	Occupations Requiring Baccalaureate Degree ▶ Agricultural Applications Software Developer/Programmer ▶ Agricultural Educator ▶ Agricultural Engineer ▶ Waste Water Treatment Plant Operator
	Year 14	Speech/ Oral Communication	Calculus	Earth Science Biological Science	American History Geography		• Technical Systems • Advanced Applications of Technical Systems	
	Year 15	Technical Writing	Statistics		Political Science		• 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=4>) 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.

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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=4>. These skills are reinforced through participation in FFA.

#2

Introduction to Power, Structural and Technical Systems: This course introduces the knowledge and skills for applying the physical science principles and principles of operation and maintenance to mechanical equipment, welding and fabrication, structures, biological systems, land treatment, power utilization, and technology including computer applications of surveying and mapping.

The following courses expose students to Pathway Knowledge and Skills found at <http://www.careerclusters.org/goto.cfm?id=4> and should include an appropriate Supervised Agricultural Experience (SAE) and FFA activities that support classroom/laboratory and SAE learnings.

#3

Structural Systems: Students will use computer skills to develop simple sketches and plans, read and relate structural plans to specifications and building codes, estimate project costs, use construction/fabrication equipment and tools, and plan and design machinery, equipment, buildings and facilities.

#4

Power Systems: This course builds on the principles of the previous course and provides more in-depth knowledge and skills as they relate to energy sources, lubricants, service and maintenance of machinery and equipment, and equipment operation. Students will apply principles of service and repair by troubleshooting problems and evaluating engine performance, follow guidelines to service and repair power transmission systems, hydraulic systems, electrical systems, heating and air conditioning systems, steering, suspension, traction and vehicle performance systems. Tools used with these procedures will allow students to demonstrate proper skills and safety.

#5

Internship in Power, Structural and Technical Systems: This course is designed for work-site learning experiences. Students have the opportunity to practice specific skills, including record keeping, and receive credit for time spent in the workplace.

#6

Power, Structural and Technical Systems: This course includes application of basic principles of science, power, structural and technical systems to solve problems dealing with machinery, buildings, and energy and related processes.

#7

Technical Systems: This course will use a variety of tools to accomplish fast and accurate production in the workplace. Students will use available power sources to plan and apply control systems including demonstrating knowledge of basic electricity and the ability to design, install and troubleshoot control systems.

#8

Advanced Applications of Technical Systems: This course will provide explanation of various types of hardware systems to show their application potential, employ appropriate techniques to demonstrate application of GIS/GPS systems principles, and use computer applications to utilize spatial data.

Notes

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