
Course Selection: Descriptions, Rationales and Rotations

The selection of courses is critical in the development of curriculum for the secondary agriculture program. The courses offered in the program and the subsequent rotation will have an impact on the recruitment and retention of students. Courses must be selected that meet the future career aspirations of students and reflect the agriculture, food, fiber, and natural resources of the community. Career Pathways can also be valuable in guiding course selection for the secondary agriculture program (see the following page for Career Pathways chart).

Career Pathways help students achieve their career ambitions and goals. The knowledge, skills, and attitudes attained through a sequence of coherent agriculture, food, and natural resources courses will help students be successful in their chosen life's work. Students may select one pathway or courses in several pathways that serve their particular interests. Career Pathways provide students with opportunities to pursue their interest in high school and lead to more concentrated studies in four year colleges/universities, two-year community colleges, and/or technical colleges/schools.

The first step involved in creating course offerings is to determine the number of courses and sections of entry-level classes that will be offered. Single teacher programs may offer one section of Agricultural Science I and one section of Agricultural Science II as pre-requisites for advanced agriculture courses. Multiple teacher departments may choose to offer multiple sections of Agricultural Science I and II and possibly horticulture or natural resource courses as a broader range of entry-level options for students. Input from the program's advisory committee should be helpful in determining the appropriate options for entry-level courses in the local program.

The second step in developing course offerings is to determine which advanced courses to offer. Again the advisory committee should be consulted for input regarding the appropriate mix of advanced courses that should be offered to accommodate the needs and interests of potential students. Offering advanced courses on an alternating year basis allows students to enroll in a broader range of courses. However, scheduling conflicts (especially with courses required for graduation, college-prep certificate, etc.) may present barriers to student enrollment.

Scheduling entry-level or advanced courses should minimize conflicts with required courses or other popular elective courses (e.g. band, music, etc.). It is especially important to schedule courses at times when most students are free to enroll. Scheduling entry-level courses during periods when large groups of students are committed to register for another class will reduce enrollment in agriculture education, which can have a carry-over effect for subsequent years.

Course offerings are often scheduled in a two-year rotation to provide students with an access to a broader range of courses and subject content. Two criteria that should be considered in developing course offerings are flexibility and choice; the offerings should allow flexibility in scheduling and provide access to courses for those students who choose to enroll.

Agriculture, Food & Natural Resources Career Cluster

Middle School Course

Exploring Agriculture (016700)

High School Core Courses (completed in sequential order)

Agricultural Science I (016710) / Agricultural Science II (016760)

Courses within Designated Career Cluster (Career Pathways) in Non-sequential Order

Agricultural Business & Management Systems 01.0101	Agricultural Mechanics & Technology Systems 01.0201	Plant Science & Horticulture Systems 01.0601	Food Science Systems 01.0401	Natural Resources Conservation Systems 03.0101	Animal Science Systems 01.0901
Agricultural Management & Economics (016730)	Agricultural Structures (016720)	Agricultural Communications (016742)	Agricultural Communications (016742)	Agricultural Communications (016742)	Animal Science (016711)
Agricultural Sales & Marketing (016741)	Agricultural Communications (016742)	Biotechnology (016743)	Food Science & Technology (016790)	Conservation of Natural Resources (016759)	Agricultural Communications (016742)
Agricultural Communications (016742)	Agricultural Power I (016751)	Crop Science (016761)	Food Science (FACS) (096827)	Forestry Management (016763)	Biotechnology (016743)
Supervised Agricultural Experience Co-op (016780)	Agricultural Power II (016752)	Floriculture (016763)	Supervised Agricultural Experience Co-op (016780)	Supervised Agricultural Experience Co-op (016780)	Equine Science (016744)
	Agricultural Machinery (016753)	Landscaping (016764)			Veterinary Science (016745)
	Agricultural Construction (016770)	Greenhouse Operation & Management (016765)			Supervised Agricultural Experience Co-op (016780)
	Supervised Agricultural Experience Co-op (016780)	Nursery Operation & Management (016766)			
		Turf Management (016767)			
		Supervised Agricultural Experience Co-op (016780)			

All courses include classroom/laboratory instruction, Supervised Agricultural Experiences (SAE), and leadership development through the National FFA Organization.

Developing a good relationship with guidance counselors can be mutually beneficial. Counselors who are fully informed about the purpose and benefits of the secondary agriculture program will generally work to minimize course scheduling conflicts, although some conflicts are unavoidable. Agriculture instructors should not assume that guidance counselors are knowledgeable of the goals and objectives of the Agricultural Education Program. Therefore, the agriculture instructor should periodically send information to the guidance counselor regarding the purposes, benefits, and accomplishments of the program. Developing a cordial and cooperative relationship with the guidance counselor should result in a win – win situation. Agriculture instructors should approach the relationship from the perspective of how they can help the guidance counselor while simultaneously benefiting the Agricultural Education Program.

Approved Secondary Agriculture Courses

The following courses are approved for the agriculture curriculum in secondary schools. Course descriptions should be developed to communicate the content of the course to current and prospective students, parents, school administrators, and guidance counselors. Rationales must also be developed for each course to justify why the subject area and/or course is being taught based upon the school district's philosophy, projected needs of students, and the future needs of students to become useful citizens, workers, and family members. If the need arises to teach a subject not included in this list, a request for the approval of a special course must be made in advance to Director, Agricultural Education, State Department of Elementary and Secondary Education, PO Box 480, Jefferson City MO 65102.

Sample Descriptions and Rationales

(**CD** – Core Data code, **CIP** – Classification of Instructional Programs code)

Junior High/Middle School Course – One period per day for six weeks, one quarter, or one semester.

1. **Exploring Agriculture** – A general literacy course designed to introduce and apply life skills related to one of America's basic industries - agriculture. Units of instruction will be selected from Introduction to Agriculture, Plant Science, Animals in Society, Products from Agriculture, Natural Resources and Conservation, Leadership and Personal Development, and Basic Home and Farmstead Safety and Maintenance. (**CD** 016700)

Course Rationale – Agriculture is one of America's basic industries, employing over 20% of the nation's workforce. Agriculture encompasses the food, fiber, conservation and natural resource systems. Making students aware of the diversity of the possible careers within this broad field of agriculture helps them to become an informed productive citizen in our society.

Entry Level Secondary Agriculture Courses

The “program of instruction” for secondary students should involve both depth and breadth and be organized with an entry-level sequence in combination with advanced courses in agriculture. The entry-level sequence should begin with a two-semester course. A second prerequisite course should be offered unless unusual conditions exist at the local level.

1. **Agricultural Science I** – A course designed for instruction in animal science, agricultural mechanics, career exploration, leadership and personal development, and supervised agricultural experience. Units may include agribusiness, natural resources, and food science. (CD 016710, CIP 01.0899)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. An understanding of careers, leadership, and basic principles in the animal industry provides a sound background for the agricultural industry.

2. **Agricultural Science II** – A course designed for instruction in plant and crop science, soils, entomology, horticulture, and forestry, and additional instruction in agricultural mechanics, career development, leadership, and supervised agricultural experience. (CD 016760, CIP 01.0899)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. An understanding of the careers, leadership, and basic principles in the agriculture plant and food industry provides a sound background to pursue an agricultural career.

Advanced Secondary Agriculture Courses

The following specialized courses are for students who have successfully completed or are concurrently enrolled in Agricultural Science I and/or II Courses. All advanced courses should include instruction in leadership development and supervised agricultural experience.

1. **Agribusiness Sales and Marketing and Management** – This course includes human relations, personal inventory, careers in selling, and other experiences necessary for employment in agribusiness engaged in marketing, purchasing, storing, grading, and transporting supplies and products. (CD 016741, CIP 01.0102)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Application of economics, sales, marketing, and human relation skills are essential for entry-level employment in agribusiness.

2. **Agricultural Communications and Leadership** – This course will enable students to develop the knowledge, attitudes and skills to demonstrate positive leadership for agriculture. Areas of focus include public speaking, extemporaneous speaking, impromptu

speaking, written communication, meeting people, good first impressions, personal goals, team work, team/organizational goals, organizing groups to take action and evaluation of team/organizational actions. (CD 016742, CIP 01.0802)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Leadership and communication skills are required for individual success in all agricultural careers, and the agriculture industry needs spokespersons and leaders to represent it in an increasingly urban population.

3. **Agricultural Construction** – This course utilizes welding in the development and construction of major metal and wood projects. (CD 016770, CIP 01.0201)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Advanced skills in welding, woodworking, and project construction provide students with entry-level agricultural construction skills.

4. **Agricultural Machinery** – This course includes selection, operation, adjustment, maintenance and repair of machinery commonly used on the farm. (CD 016753, CIP 01.0204)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. The safe operation, adjustment and maintenance of agricultural equipment are essential skills for students pursuing a career in agricultural mechanics.

5. **Agricultural Management and Economics** – This course combines farm management, agribusiness management, and content based on agricultural economic principles. Computer applications are included to enhance student understanding and utilization of current technology. Units include human relations, verbal and written communication, microcomputers in agriculture, economic principles, farm planning, agribusiness functions, and business management. (CD 016730, CIP 01.0101)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Application of economic principles and business management to the agriculture industry provides the basis for financial success of an agribusiness.

6. **Agricultural Power I** – This course develops skills in the maintenance, repair, adjustment, and overhaul of small engines. (CD 016751, CIP 01.0201)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Small engines provide development of mechanical skills and principles needed to pursue a career in agricultural mechanics.

7. **Agricultural Power II** – This is a study of the basic principles of power transmissions, hydraulic systems, and tractor engines. Tractor operation, safety practices, and maintenance will receive major emphasis. Tractor overhaul will be included where feasible. (CD 016752, CIP 01.0205)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Advanced principles and operations of transmissions, hydraulic systems, and tractor engines provide entry-level skills in agricultural mechanics.

8. **Agricultural Structures** – This course includes electrical wiring, electrical motors, concrete masonry, plumbing and sewage disposal, farm fences, product handling and processing equipment, and farm buildings. (CD 016720, CIP 01.0201)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Basic construction skills and knowledge in electricity, plumbing, concrete, and masonry are necessary for the building of agricultural structures.

9. **Animal Science** – Advanced study in animal production, management, marketing, nutrition, breeding, production records, selection, animal health, waste management, and biotechnology may be included in this course. (CD 016711, CIP 01.0302)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Scientific principles in animal nutrition, breeding, selection, marketing, and waste management are essential for students with an interest in animals or animal-related careers.

10. **Biotechnology** – This course includes topics in the history of biotechnology, the principles of scientific research, cell biology, genetic transfer, genetically modified organisms, cloning, and the application of biotechnology to plant science, animal science, medicine, the food industry, and ecology. Consumer issues, ethics, and careers are also addressed. (CD 016743, CIP 26.1201)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Biotechnology and its applications play an important role in plant and animal agriculture as well as the environment. Students interested in advancing agriculture through scientific research learn essential skills to prepare for that role.

11. **Conservation of Natural Resources** – This course prepares students for activities in the conservation and/or improvement of natural resources such as oil, water, air, forests, fish and wildlife for economic and recreational purposes. (CD 016759, CIP 03.0101)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural

resource systems, employing over 20% of the nation's workforce. Management of our natural resources, wildlife, and ecological systems is an essential component in sustaining our environment.

12. **Crop Science** – Units in this course include growing systems, plant selection, production practices, harvesting, storing, marketing, fertilization, soils, conservation, chemicals, integrated pest management, water quality, and biotechnology. (CD 016761, CIP 01.0304)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation's workforce. Scientific principles in plant nutrition, breeding, selection, harvesting, soil management, and water quality are essential for students with an interest in agronomy and natural resource-related careers.

13. **Equine Science** – This course presents topics including conformation and selection, genetics and reproduction, health and soundness, nutrition, equipment and facilities, safe handling techniques, horse psychology, training methods, and career opportunities. (CD 016744, CIP 01.0307)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation's workforce. The horse industry is a strong segment of Missouri agriculture, and there is a need for employees who have knowledge and skills in selecting, breeding, training and caring for horses.

14. **Floriculture** – This course includes the production, arrangement and retailing of flowers. It includes fresh, silk, or dried flowers to be used in the design of corsages, wedding bouquets, table flower arrangements, and seasonal holiday decorations. (CD 016763, CIP 01.0608)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation's workforce. Basic skills in production, arrangement, and retailing of flowers are necessary for students having a career interest in horticulture.

15. **Food Science and Technology** – This course includes the areas of food chemistry and nutrition, food additives, food packaging and labeling, evaluation of foods, food microbiology, food processing, food fermentation, principles of sanitation and quality control. (CD 016790, CIP 01.0401)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation's workforce. Food chemistry, microbiology, additives, sanitation, quality control, and processing are all essential in providing society with a safe and plentiful food supply.

16. **Forest Management** – This course includes the following aspects of forestry: economic and environmental importance, harvesting equipment and methods, safety, business agreements for the procurement and/or sale of standing timber, surveying and land measurement, scaling

and grading, and the equipment and marketing of Missouri wood products. (CD 016762, CIP 03.0506)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Harvesting and marketing of timber and wood products has an economic and environmental impact on this renewable natural resource.

17. **Greenhouse Operation and Management** – This course develops a basic understanding of greenhouse techniques. The production of greenhouse crops will be used to demonstrate procedures such as plants started from cuttings, seeds, grafts, and layering. Students will manage their own crop as a greenhouse project. (CD 016765, CIP 01.0604)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Cutting, seeding, grafting, layering, and management of a greenhouse provide entry level and entrepreneurial opportunities for students with an interest in horticulture.

18. **Landscaping** – This course includes the basic techniques of landscape design, landscape construction, installation, and maintenance. (CD 016764, CIP 01.0605)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Design, construction, installation, and maintenance are essential skills for a landscaping business.

19. **Nursery Operation and Management** – This course includes the production of plants, shrubs, and trees for the purpose of transplanting or propagation. Approved practices in wholesaling and retailing of nursery crops will be applied. (CD 016766, CIP 01.0606)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. The propagation of plants, shrubs, and trees for transplanting prepares students for production, management, wholesaling and retailing of nursery crops.

20. **Turf Management** – This course includes a study of soils and fertilizers for sod production. Also included are the skills needed for the establishment and maintenance of turf. (CD 016767, CIP 01.0607)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. The establishment and maintenance of turf grasses is a growing agricultural business sector.

21. **Veterinary Science** – Both food and companion animals are studied in this course. Topics include cell and tissue biology, anatomy, physiology, nutrition, disease prevention and diagnosis, and surgical procedures. (CD 016745, CIP 01.0302)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. This basic veterinary science study provides students with knowledge and skills needed in both the livestock and pet industries.

22. **Supervised Agricultural Experience Co-op** – This course provides for the enrollment of students that are released on school time to complete a cooperative occupational experience in an approved training station in agriculture. A signed training agreement and training plan must be completed for each student. (CD 016780, CIP 01.9999)

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation’s workforce. Providing on-the-job training experiences helps students to be more productive citizens in our society.

Course Rotation

(Single teacher program with a 7 period schedule)

SAMPLE Agriculture Department

Career Pathways: Agricultural Business & Management Systems

Agricultural Mechanics & Technology Systems

Year: 20__ - 20__		
Period	First Semester	Second Semester
1	Agricultural Science I	Agricultural Science I
2	Agricultural Science II	Agricultural Science II
3	Agribusiness Sales, Marketing, & Mgt	Agribusiness Sales, Marketing, & Mgt
4	Animal Science	Food Science & Technology
5	Agricultural Construction	Agricultural Construction
6	SAE Supervision	SAE Supervision
7	Planning	Planning

Year: 20__ - 20__		
Period	First Semester	Second Semester
1	Agricultural Science I	Agricultural Science I
2	Agricultural Science II	Agricultural Science II
3	Agricultural Management & Economics	Agricultural Management & Economics
4	Conservation of Natural Resources	Conservation of Natural Resources
5	Agricultural Power I	Agricultural Structures
6	SAE Supervision	SAE Supervision
7	Planning	Planning

Note. 7-period system assumes 50 minute class periods with an average 250 minutes of instruction per week.

Course Rotation

(Single teacher program with an 8-block schedule)

 SAMPLE Agriculture Department

Career Pathways: Agricultural Business & Management Systems
Agricultural Mechanics & Technology Systems
Plant Science & Horticulture Systems

Year: 20__ - 20__		
Period	“A” Day First / Second Semester	“B” Day First / Second Semester
1	Agricultural Science I	Agricultural Science II
2	Agricultural Power I	Agricultural Management & Economics
	Agricultural Structures	
3	Agricultural Construction	Floriculture
		Landscaping
4	SAE Supervision & Planning	SAE Supervision & Planning

Year: 20__ - 20__		
Period	“A” Day First / Second Semester	“B” Day First / Second Semester
1	Agricultural Science I	Agricultural Science II
2	Agricultural Construction	Agribusiness Sales, Marketing, & Mgt
3	Greenhouse Operation & Management	Conservation of Natural Resources
		Forestry
4	SAE Supervision & Planning	SAE Supervision & Planning

Note. 8-block system assumes 90 minute class periods with an average 225 minutes of instruction per week.

Course Rotation

(Single teacher program with a 10-block schedule)

SAMPLE Agriculture Department

Career Pathways: Agricultural Business & Management Systems

Agricultural Mechanics & Technology Systems

Animal Science Systems

Year: 20__ - 20__		
Period	“A” Day First / Second Semester	“B” Day First / Second Semester
1	Agricultural Science I	Agricultural Science II
2	Agricultural Power I	Agricultural Management & Economics
	Agricultural Structures	
3	Agricultural Construction	Conservation of Natural Resources
		Forestry
4	Planning	Exploring Agriculture
		Greenhouse Operation & Management
5	SAE Supervision	Planning

Year: 20__ - 20__		
Period	“A” Day First / Second Semester	“B” Day First / Second Semester
1	Agricultural Science I	Agricultural Science II
2	Animal Science	Agribusiness Sales, Marketing, & Mgt
	Food Science & Technology	
3	Agricultural Construction	Floriculture
		Landscaping
4	Planning	Exploring Agriculture
		Crop Science
5	SAE Supervision	Planning

Note. 10-block system assumes 70 minute class periods with an average 175 minutes of instruction per week.