Florida Department of Education
Curriculum Framework

Program Title: **Agritechnology**
Program Type: **Career Preparatory**
Career Cluster: **Agriculture, Food and Natural Resources**

Program Number	8106800
CIP Number	0101039901
Grade Level	9-12
Program Length	3 credits
Teacher Certification	Refer to the **Program Structure** section.
CTSO	FFA
SOC Codes (all applicable)	19-4011 -- Agricultural and Food Science Technicians
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Agriculture, Food and Natural Resources (AFNR) career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Agriculture, Food and Natural Resources career cluster.

The content includes but is not limited to instruction in animal and plant production and processing; agriculture marketing; agricultural mechanics; employability skills; mathematics; basic science; biological sciences; communications; and human-relations skills.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of three courses. Planned and Supervised Agricultural Experiences (SAE) must be provided through one or more of the following: (1) foundational career exploration, (2) directed laboratory experience, (3) project ownership/entrepreneurship, (4) cooperative education/internship, (5) School Based Enterprise, or (6) Service Learning.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the secondary program structure:

8106810	Agriscience Foundations 1	AGRICULTUR 1 @2 AGRICULTUR 7G	1 credit		3	EQ
8106820	Agritechnology 1		1 credit	19-4011	2	CT
8106830	Agritechnology 2		1 credit	19-4011	2	CT

(Graduation Requirement Codes: CT= Career & Technical Education, EQ= Equally Rigorous Science, EC= Economics, MA= Mathematics, PL= Personal Financial Literacy)

National Standards (NS): Council for Agricultural Education

Some or all of the courses in this program have been aligned with National Standards AFNR Standards from the Council for Agricultural Education. If so, the standards have been identified and cross walked with the corresponding CTE standard and/or benchmark. National Standards can be found by accessing the following link: https://ffa.app.box.com/v/Library/folder/52815452676.

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.

2. Apply appropriate academic and technical skills.

3. Attend to personal health and financial well-being.

4. Communicate clearly, effectively and with reason.

5. Consider the environmental, social and economic impacts of decisions.

6. Demonstrate creativity and innovation.

7. Employ valid and reliable research strategies.

8. Utilize critical thinking to make sense of problems and persevere in solving them.

9. Model integrity, ethical leadership and effective management.

10. Plan education and career path aligned to personal goals.

11. Use technology to enhance productivity.

12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

Agriscience Foundations 1

1.0 Examine the history of AFNR production at the local, national, and global level.
2.0 Employ scientific reasoning to make informed decisions in AFNR systems.
3.0 Apply scientific skills and principles in natural resources.
4.0 Apply scientific skills and principles in plant science.
5.0 Apply scientific skills and principles in animal science.
6.0 Apply scientific skills and principles in food science.
7.0 Apply scientific skills and principles in power, structure, and technical systems.
8.0 Explore AFNR professional development organizations.

Agritechnology 1

9.0 Explore the scope of the agriscience industry.
10.0 Determine proper animal health and nutrition.
11.0 Identify components of reproduction.
12.0 Identify procedures in animal production.
13.0 Develop procedures for exhibiting animals.
14.0 Compare, select, and use plant production systems.
15.0 Investigate proper methods to fertilize plants and crops.
16.0 Operate, maintain, and service facilities, tools, and equipment.
17.0 Apply principles of agribusiness finance.
18.0 Students evaluate the importance of the food and fiber system to understand the impact on global economy.
19.0 Examine the scope of career opportunities in and the importance of agriculture to the economy.

Agritechnology 2

20.0 Analyze the scope of the Agriscience industry.
21.0 Recommend steps for proper animal health and nutrition.
22.0 Select, and use plant production systems.
23.0 Fertilize plants and crops.
24.0 Irrigate plants and crops.
25.0 Control plant pests.
26.0 Maintain, and service facilities, tools, and equipment.
27.0 Describe procedures for harvesting and marketing agricultural products.
28.0 Compare principles of agribusiness finance.
29.0 Explain the components of the American business system.
30.0 Investigate agricultural cooperatives structure and function.

Florida Department of Education
Student Performance Standards

Course Title: **Agriscience Foundations 1**
Course Number: **8106810**
Course Credit: **1**

Course Description:

This course is designed to develop competencies in the areas of agricultural history and the global impact of agriculture; career opportunities; scientific and research concepts; biological and physical science principles; environmental principles; agriscience safety; principles of leadership; and agribusiness, employability, and human relations skills in agriscience. Laboratory-based activities are an integral part of this course. These include the safe use and application of appropriate technology, scientific testing and observation equipment.

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental quality, and safety procedures will be an integral part of this course. Students will interact with materials and primary sources of data or with secondary sources of data to observe and understand the natural world. Students will develop an understanding of measurement error, and develop the skills to aggregate, interpret, and present the data and resulting conclusions. Equipment and supplies will be provided to enhance these hands-on experiences for students. A minimum of 20% of classroom time will be dedicated to laboratory experiences.

Agriscience Foundations 1 (8106810) is part of several programs across the Agriculture, Food & Natural Resources career cluster. To ensure consistency, the standards and benchmarks for this course (01.0 – 8.0) have been placed in a separate document. To access this document, visit: https://www.fldoe.org/core/fileparse.php/20706/urlt/Agsci-Fnds1-Core-2425.rtf

Florida Department of Education
Student Performance Standards

Course Title: **Agritechnology 1**
Course Number: **8106820**
Course Credit: **1**

Course Description:

This course is designed to develop competencies in the areas of agriscience industry careers; prevention and treatment of livestock diseases; livestock anatomy; wholesale cuts of meat; animal reproduction and identification; animal safety; animal-health certification; plant growth; plant fertilization; safe use of pesticides; maintenance of tools and equipment; record keeping; and employability skills.

CTE Standards and Benchmarks			National Standards
1.0	Explore the scope of the agriscience industry. The student will be able to:		
	1.1	Investigate career opportunities in agriscience industries.	CS.05.01.01.a
	1.2	Describe training requirements for entry and advancement in agriscience careers.	CS.05.02.02.a
2.0	Determine proper animal health and nutrition. The student will be able to:		
	2.1	Demonstrate proper methods to clean and disinfect animal equipment and facilities.	
	2.2	Explain proper disposal of animal waste with regards to sanitation, economics and environmental implications.	AS.08.01.01.a
	2.3	Describe a livestock animals digestive system.	
	2.4	Describe nutritional requirements of animals.	AS.03.01.01.a
3.0	Identify components of reproduction. The student will be able to:		
	3.1	Examine livestock and poultry reproductive anatomy.	AS.04.01.01.b
	3.2	Explain the reproductive cycles of commercially important animals.	
	3.3	Compare and select appropriate breeding methods for different agricultural enterprises.	
	3.4	Describe approved care for newborn animals.	AS.04.02.04.a
4.0	Identify procedures in animal production. The student will be able to:		
	4.1	Compare and contrast desirable characteristics of breeding and market animals.	AS.04.02.01.b
	4.2	Evaluate wholesale cuts of beef, pork, lamb and poultry.	
	4.3	Describe methods of animal identification.	
	4.4	Describe methods of restraining, loading, handling and transporting animals safely.	
5.0	Develop procedures for exhibiting animals. The student will be able to:		
	5.1	Demonstrate the procedures for preparing, maintaining and handling livestock.	
	5.2	Compare and contrast appropriate livestock evaluation criteria.	AS.06.03.02.a
	5.3	Prepare appropriate registrations, shipping and health certificates required for exhibiting or marketing animals.	

	5.4 Demonstrate appropriate grooming and showmanship skills.	
6.0	Compare, select, and use plant production systems. The student will be able to:	
	6.1 Compare different plant production systems. (Seed, cutting, air layer and tissue culture).	
	6.2 Propagate, transplant and grow plants.	
	6.3 Select and prepare a site and/or a seedbed for planting.	
	6.4 Identify methods of pruning plants to achieve desired growth and to maintain health.	
	6.5 Identify types of hydroponic systems.	
	6.6 Identify methods used in hydroponic systems.	
7.0	Investigate proper methods to fertilize plants and crops. The student will be able to:	
	7.1 Interpret information on a fertilizer label.	
	7.2 Compare sources and forms of nutrients.	
	7.3 Determine methods of applying fertilizer materials.	
	7.4 Collect soil sample to determine nutrient levels.	PS.01.03.03.a
	7.5 Test for pH and soluble salts.	
8.0	Operate, maintain, and service facilities, tools and equipment. The student will be able to:	
	8.1 Use and maintain hand tools and power equipment (e.g., power saws, welders).	PST.02.02.02.b
	8.2 Describe maintenance and service of small engines.	
	8.3 Introduce science principles as applied in selected mechanical applications (e.g., hydraulics, and internal combustion).	
9.0	Apply principles of agribusiness finance. The student will be able to:	
	9.1 Identify components of balance sheets and income statements.	ABS.02.01.01.a
	9.2 Identify major sources of credit for agribusiness.	ABS.03.02.02.a
	9.3 Complete a business loan application.	
	9.4 Maintain and interpret agribusiness financial records including depreciation, inventory, and budgets.	
10.0	Evaluate the importance of the food and fiber system to understand the impact on global economy. The student will be able to:	
	10.1 Assess the agricultural impact upon the US gross national product and the total global economy.	CS.02.02.03.b
	10.2 Investigate local, state and national regulatory laws, industry regulations and legislation for agricultural businesses.	
	10.3 Identify and describe the primary government agencies involved with agriculture.	
	10.4 Research new and emerging technologies and their impact on the economy.	CS.01.02.02.c
	10.5 Describe the value of the food and agribusiness industry.	
11.0	Examine the scope of career opportunities in and the importance of agriculture to the economy. The student will be able to:	
	11.1 Define and explore agriculture and agribusinesses and their role in the economy.	CS.02.02.03.a
	11.2 Evaluate and explore the agribusiness career opportunities in agriculture.	
	11.3 Compare how key organizational structures and processes affect organizational performance and the quality of products and services.	

Florida Department of Education
Student Performance Standards

Course Title: **Agritechnology 2**
Course Number: **8106830**
Course Credit: **1**

Course Description:

This course is designed to develop competencies in the areas of welding; small gasoline engine service and repair; preventative maintenance procedures; irrigation system repair; refrigeration; new and emerging technologies; financial management skills; and employability skills.

CTE Standards and Benchmarks		National Standards
12.0	Analyze the scope of the agriscience industry. The student will be able to:	
12.1	Identify and describe the importance of professional and trade organizations.	
12.2	Examine and interpret trade journals, and academic research in the agriscience industry.	
12.3	Complete a job application.	
13.0	Recommend steps for proper animal health and nutrition. The student will be able to:	
13.1	Recognize, describe, and demonstrate prevention and treatment of common animal diseases, disorders and pests.	AS.07.01.03.b
13.2	Read, interpret, and demonstrate correct uses of pesticides, medication and other additives according to their labels.	
13.3	Formulate and compute least-cost feed rations.	AS.03.01.02.b
13.4	Select and apply growth stimulators and implants.	AS.03.02.03.c
13.5	Determine feeding rates and methods of feeding animals.	
14.0	Select, and use plant production systems. The student will be able to:	
14.1	List the leading local (community) varieties of commonly grown crops for commercial production.	
14.2	Recommend varieties of local commercial plants and field crops.	
14.3	Identify the recommended planting rate, spacing requirements and growth times for common garden crops.	
14.4	Describe the operation of and adjustment of plant production equipment	
15.0	Fertilize plants and crops. The student will be able to:	
15.1	Develop fertilization schedules and calculate fertilizer rates for plants.	PS.01.03.06.c
15.2	Identify common nutrient-deficiency symptoms in plants.	PS.01.03.01.b
15.3	Calibrate fertilization equipment and fertilize plants.	PS.01.03.04.c
16.0	Irrigate plants and crops. The student will be able to:	
16.1	Recognize soil and plant conditions indicating irrigation needs and develop an irrigation schedule.	
16.2	Compare and select irrigation equipment and methods.	
16.3	Install, operate, maintain, and repair irrigation equipment.	

	16.4 Develop Best Management Practices (BMP) for water use.	
17.0	Control plant pests. The student will be able to:	
	17.1 Compare and contrast common plant pests and their damages.	PS.03.03.01.a
	17.2 Diagram life cycles of insects, pests and diseases.	PS.03.03.02.a
	17.3 Interpret the procedures and requirements for obtaining a restricted-use-pesticide operator's license.	
	17.4 Select, mix and apply a no restricted chemical according to the label and local, state, federal and EPA regulations.	
	17.5 Describe biological, chemical and cultural methods of controlling plant pests.	PS.03.03.03.c
	17.6 Develop Best Management Practices for pest management.	
18.0	Maintain, and service facilities, tools, and equipment. The student will be able to:	
	18.1 Discuss basic facility maintenance, installation or repair. (e.g., welding, electricity, plumbing, fencing, construction)	
	18.2 Safely operate, maintain, service and repair equipment.	
19.0	Describe procedures for harvesting and marketing agricultural products. The student will be able to:	
	19.1 Determine maturity, condition, quality and volume of products (produced by program) to be harvested.	
	19.2 Describe procedures for harvesting products (produced by program).	PS.03.05.01.a
	19.3 Collect and interpret market reports and identify market outlets for agricultural products (produced by program).	
	19.4 Organize a marketing program for an agricultural product (produced by program or student).	
	19.5 Assess kinds and types of storage facilities for agricultural products (produced by program).	PS.03.05.04.b
	19.6 Grade, treat, pack, and/or store harvested products (produced by program).	PS.03.05.05.b
20.0	Compare principles of agribusiness finance. The student will be able to:	
	20.1 Explain the purposes and structures of contracts, leases, deeds and insurance policies.	
	20.2 Complete a State FFA Degree or Proficiency Applications.	
	20.3 Identify tax structure of agricultural business. (ex., Property tax, intangible taxes, income taxes)	
21.0	Explain the components of the American business system. The student will be able to:	
	21.1 Describe the five basic ways American business is organized.	
	21.2 Distinguish and identify between the characteristics of each method of doing business.	
	21.3 Evaluate the advantages and disadvantages provided by each business method.	
	21.4 Evaluate how cooperative principles and practices differentiate cooperatives from other businesses.	
22.0	Investigate agricultural cooperatives structure and function. The student will be able to:	
	22.1 Explain the definition of a cooperative.	
	22.2 Explain the history of cooperative principles and practices.	
	22.3 Describe the five areas that classify cooperative structure.	
	22.4 Distinguish and identify between the five types of cooperative structure and their functions.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Florida Standards for English Language Development (ELD)

English language learners communicate for social and instructional purposes within the school setting. ELD.K12.ELL.SI.1

English Language Development (ELD) Standards Special Notes:
Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate for social and instructional purposes within the school setting. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. For additional information on the development and implementation of the ELD standards, please contact the Bureau of Student Achievement through Language Acquisition at SALA@fldoe.org

Extended Student Supervision

Because of the production and marketing cycle of the agriculture industry, this program requires individual instruction and supervision of students for the entire period beyond the 180-day school year.

Career and Technical Student Organization (CTSO)

Florida FFA is the co-curricular career and technical student organization providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE)) will need modifications to meet their needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular course or a modified course. If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete a Career and Technical Education (CTE) course. The student should work on different competencies and new applications of competencies each year toward completion of the CTE course. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number for eligible students with disabilities.