

AGRICULTURE BUSINESS & MANAGEMENT TECHNOLOGY MISSISSIPPI CURRICULUM FRAMEWORK

Agribusiness Management Technology (Program CIP: 01.0102 - Agribusiness/Agricultural Business Operations)
Animal Science Technology - Beef Option (Program CIP: 01.0302 – Animal/Livestock Husbandry and Production)
Animal Science Technology - Poultry Option (Program CIP: 01.0907 – Poultry Science)
Field Crops (Program CIP: 01.0304 – Crop Production)
Precision Agriculture Technology (Program CIP: 01.1105 – Plant Protection and Integrated Pest Management)

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The Office of Curriculum and Instruction (OCI) was founded in 2013 under the Division of Workforce, Career, and Technical Education at the Mississippi Community College Board (MCCB). The office is funded through a partnership with The Mississippi Department of Education (MDE), who serves as Mississippi's fiscal agent for state and federal Career and Technical Education (CTE) Funds. The OCI is tasked with developing statewide CTE curriculum, programming, and professional development designed to meet the local and statewide economic demand.

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ADOPTION OF NATIONAL CERTIFICATION STANDARDS

Agriculture is a highly technical and ever-changing industry upon which everyone is dependent. We will maintain agriculture as our nation's number one industry only if we understand the importance of the different agrisciences, of marketing strategies, of safe food production and of the need for continuous research to improve agriculture. Strong, relevant agriscience programs are one way we can maintain our nation's agricultural edge.

The National AFNR Career Cluster Content Standards were developed as part of the National FFA 10 x 15 project to provide state agricultural education leaders and teachers with a forward-thinking guide for what students should know and be able to do through the study of agriculture in grades 9 through 14. The National AFNR Career Cluster Content Standards should be used as a guide to develop well-planned curriculum in agriscience education to be delivered to students throughout the country. Just as agriculture varies throughout our nation, so will our agricultural education programs. States should use these standards in conjunction with state and local advisory committees to determine what is most relevant and appropriate for their students in providing that all-important link between the school and the business community. The standards, performance elements, performance indicators and measurements should be used by educators to guide agricultural education curriculum development at the state and local levels. Structure and Organization The National AFNR Career Cluster Content Standards are organized into eight pathways. These pathways are:

- _ ***Agribusiness Systems (ABS)***—the study of business principles, including management, marketing and finance, and their application to enterprises engaged in Agriculture, Food and Natural Resources
- _ ***Animal Systems (AS)***—the study of animal systems, including life processes, health, nutrition, genetics, management and processing, through the study of small animals, aquaculture, livestock, dairy, horses and/or poultry
- _ ***Biotechnology Systems (BS)***—the study of data and techniques of applied science for the solution of problems concerning living organisms
- _ ***Environmental Service Systems (ESS)***—the study of systems, instruments and technology used in waste management and their influence on the environment
- _ ***Food Products and Processing Systems (FPP)***—the study of product development, quality assurance, food safety, production, sales and service, regulation and compliance, and food service within the food science industry
- _ ***Natural Resource Systems (NRS)***—the study of the management of soil, water, wildlife, forests and air as natural resources
- _ ***Plant Systems (PS)***—the study of plant life cycles, classifications, functions, structures, reproduction, media and nutrients, as well as growth and cultural practices, through the study of crops, turf grass, trees and shrubs and/or ornamental plants
- _ ***Power, Structural and Technical Systems (PST)***—the study of agricultural equipment, power systems, alternative fuel sources and precision technology, as well as woodworking, metalworking, welding and project planning for agricultural structures

Permission was granted from the National Council for Agricultural Education. To learn more information about the National AFNR Career Cluster Content Standards contact:

National Council for Agricultural Education
1410 King Street, Suite 400
Alexandria, VA 22314
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<https://www.ffa.org/thecouncil>

INDUSTRY JOB PROJECTION DATA

Agricultural Business

Agricultural business occupations require a minimal education level of a high school diploma or its equivalent. The Bureau of Labor Statistics reports that there will be a 19% decrease in job outlook. Median annual income for agricultural managers is \$69,300.00 at the national level. A summary of occupational data from the Bureau of Labor Statistics Data Center and the State Workforce Investment Board data is displayed below:

Table 1: Education Level

Program Occupations	Education Level
Farmers, Ranchers, and Other Agricultural Managers	High School Diploma

Table 2: Occupational Overview

	Region	State	United States
2010 Occupational Jobs	<10	<10	930,600
2020 Occupational Jobs	<10	<10	750,700
Total Change			-179,900
Total % Change			-19%
2010 Median Hourly Earnings	\$34.75	\$34.75	\$33.32
2010 Median Annual Earnings	\$72,280.00	\$72,280.00	\$69,300
Annual Openings	0	0	Not Reported

Table 3: Occupational Breakdown

Description	2010 Jobs	2020 Jobs	Annual Openings	2010 Hourly Earnings	2010 Annual Earnings 2,080 Work Hours
Farmers, Ranchers, and Other Agricultural Managers	<10	<10	0	\$34.75	\$72,280.00
TOTAL	<10	<10	0	\$34.75	\$72,280.00

Table 4: Occupational Change

Description	Regional Change	Regional % Change	State % Change	National % Change
Farmers, Ranchers, and Other Agricultural Managers	Not Reported	Not Reported	Not Reported	-19%

Animal Agriculture/Husbandry

Agricultural Animal Science Technology occupations require an education level of a high school diploma or its equivalent. The occupation also requires short-term on-the-job training. There is a flat need in occupational demand at the regional level and a 2.70% increase at the state level. Median annual income for these occupations is \$41,516.80 at the state level and \$48,318.40 at the regional level. A summary of occupational data from the State Workforce Investment Board Data Center is displayed below:

Table 1: Education Level

Program Occupations	Education Level
Animal breeders	Short-term on-the-job training

Table 2: Occupational Overview

	Region	State	United States
2010 Occupational Jobs	<10	37	10920
2020 Occupational Jobs	<10	38	11031
Total Change	0	1	111
Total % Change	0.00%	2.70%	1.02%
2010 Median Hourly Earnings	\$19.96	\$23.23	\$23.18
2010 Median Annual Earnings	\$41,516.80	\$48,318.40	\$48,222.91
Annual Openings	0	0	11

Table 3: Occupational Breakdown

Description	2010 Jobs	2020 Jobs	Annual Openings	2010 Hourly Earnings	2010 Annual Earnings 2,080 Work Hours
First-Line Supervisors of Farming, Fishing, and Forestry Workers	<10	<10	0	\$19.96	\$41,516.80
TOTAL	<10	<10	0	\$19.96	\$41,516.80

Table 4: Occupational Change

Description	Regional Change	Regional % Change	State % Change	National % Change
First-Line Supervisors of Farming, Fishing, and Forestry Workers	0	0.00%	3.23%	1.00%

Field Crops

Field crop occupations require an education level of a high school diploma or its equivalent. There is no change in occupational demand at the regional level and a 2.70% increase at the state level. Median annual income for this occupation is \$41,516.80 at the regional level and \$48,318.40 at the state level. A summary of occupational data from the State Workforce Investment Board Data Center is displayed below:

Table 1: Education Level

Program Occupations	Education Level
Farmers, Ranchers, and Other Agricultural Managers	High School Diploma
First-Line Supervisors of Farming, Fishing, and Forestry Workers	High School Diploma

Table 2: Occupational Overview

	Region	State	United States
2010 Occupational Jobs	<10	37	10800
2020 Occupational Jobs	<10	38	10908
Total Change	0	1	108
Total % Change	0.00%	2.70%	1.00%
2010 Median Hourly Earnings	\$19.96	\$23.23	\$23.57
2010 Median Annual Earnings	\$41,516.80	\$48,318.40	\$49,026.59
Annual Openings	0	0	10

Table 3: Occupational Breakdown

Description	2010 Jobs	2020 Jobs	Annual Openings	2010 Hourly Earnings	2010 Annual Earnings 2,080 Work Hours
First-Line Supervisors of Farming, Fishing, and Forestry Workers	<10	<10	0	\$19.96	\$41,516.80
TOTAL	<10	<10	0	\$19.96	\$41,516.80

Table 4: Occupational Change

Description	Regional Change	Regional % Change	State % Change	National % Change
First-Line Supervisors of Farming, Fishing, and Forestry Workers	0	0.00%	3.23%	1.00%

Precision Agricultural Technology

Precision agricultural technology occupations require an education level of a high school diploma or its equivalent. There is no change in occupational demand at the regional level and a 1.00% increase at the national level. Median annual income for this occupation is \$49,552.53 at the regional level and \$49,026.59 at the national level. A summary of occupational data from the State Workforce Investment Board Data Center is displayed below:

Table 1: Education Level

Program Occupations	Education Level
Farmers, Ranchers, and Other Agricultural Managers	High School Diploma
First-Line Supervisors of Farming, Fishing, and Forestry Workers	High School Diploma

Table 2: Occupational Overview

	Region	State	United States
2010 Occupational Jobs	<300	Not Reported	10800
2020 Occupational Jobs	<300	Not Reported	10908
Total Change	0	Not Reported	108
Total % Change	0.00%	Not Reported	1.00%
2010 Median Hourly Earnings	\$23.82	Not Reported	\$23.57
2010 Median Annual Earnings	\$49,552.53	Not Reported	\$49,026.59
Annual Openings	0	Not Reported	10

Table 3: Occupational Breakdown

Description	2010 Jobs	2020 Jobs	Annual Openings	2010 Hourly Earnings	2010 Annual Earnings 2,080 Work Hours
First-Line Supervisors of Farming, Fishing, and Forestry Workers	<300	<300	0	\$23.82	\$49,552.53
TOTAL	<300	<300	0	\$23.82	\$49,552.53

Table 4: Occupational Change

Description	Regional Change	Regional % Change	State % Change	National % Change
First-Line Supervisors of Farming, Fishing, and Forestry Workers	0	0.00%	3.23%	1.00%

ARTICULATION

Agribusiness Management Concentration

SEC Program	PS Program	PS Courses
S Agricultural & Environmental Science & Tech – Animals (CIP 02.0201)	PS Ag Business & Mgmt Technology <ul style="list-style-type: none"> (CIP 01.0302 Animal/Livestock Husbandry and Production) 	AGT 1214 - Applied Principles of Animal Production
S Agricultural & Environmental Science & Tech – Plants (CIP 02.0401)	PS Ag Business & Mgmt Technology <ul style="list-style-type: none"> (CIP: 01.0304 – Field Crops) 	AGT 1313 - Applied Principles of Plant Production
S Agricultural & Environmental Science & Tech - Agribusiness and Entrepreneurship Technology (CIP 01.0103)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302 Animal/Livestock Husbandry and Production) (CIP: 01.0304 – Field Crops) (CIP: 01.1105 – Precision Agriculture Technology) 	AGT 1613 - Agricultural Records
S Agriculture & Natural Resources (CIP 01.0003)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302 Animal/Livestock Husbandry and Production) (CIP: 01.0304 – Field Crops) (CIP: 01.1105 – Precision Agriculture Technology) 	AGT 1111 - Survey of Agriculture
S Concepts of Agriscience (CIP 01.9999) OR S Introduction to Agriscience (CIP 01.10001)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302 Animal/Livestock Husbandry and Production) (CIP: 01.0304) Field Crops (CIP: 01.1105) Precision Agriculture Technology 	AGT 1111 - Survey of Agriculture

Animal Science Technology Concentration

SEC Program	PS Program	PS Courses
S Agricultural & Environmental Science & Tech – Animals (CIP 02.0201)	PS Ag Business & Mgmt Technology <ul style="list-style-type: none"> (CIP 01.0302) Agricultural Animal Science Technology/Production) 	AGT 1214 - Applied Principles of Animal Production
S Agricultural & Environmental Science & Tech – Plants (CIP 02.0401)	PS Ag Business & Mgmt Technology <ul style="list-style-type: none"> (CIP: 01.0304 – Field Crops) 	AGT 1313 - Applied Principles of Plant Production
S Agricultural & Environmental Science & Tech - Agribusiness and Entrepreneurship Technology (CIP 01.0103)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302) Agricultural Animal Science Technology/Production) (CIP: 01.0304 – Field Crops) (CIP: 01.1105 – Precision Agriculture Technology) 	AGT 1613 - Agricultural Records
S Agriculture & Natural Resources (CIP 01.0003)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302) Agricultural Animal Science Technology/Production) (CIP: 01.0304 – Field Crops) (CIP: 01.1105 – Precision Agriculture Technology) 	AGT 1111 - Survey of Agriculture
S Concepts of Agriscience (CIP 01.9999) OR S Introduction to Agriscience (CIP 01.10001)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302) Agricultural Animal Science Technology/Production) (CIP: 01.0304) Field Crops (CIP: 01.1105) Precision Agriculture Technology 	AGT 1111 - Survey of Agriculture

Field Crops Concentration

SEC Program	PS Program	PS Courses
S Agricultural & Environmental Science & Tech – Animals (CIP 02.0201)	PS Ag Business & Mgmt Technology <ul style="list-style-type: none"> • (CIP 01.0302) Animal/Livestock Husbandry and Production 	AGT 1214 - Applied Principles of Animal Production
S Agricultural & Environmental Science & Tech – Plants (CIP 02.0401)	PS Ag Business & Mgmt Technology <ul style="list-style-type: none"> • (CIP: 01.0304 – Field Crops) 	AGT 1313 - Applied Principles of Plant Production
S Agricultural & Environmental Science & Tech - Agribusiness and Entrepreneurship Technology (CIP 01.0103)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> • (CIP 01.0102) Agricultural Business/Agribusiness • (CIP 01.0302) Agricultural Animal Science Technology/Production) • (CIP: 01.0304 – Field Crops) • (CIP: 01.1105 – Precision Agriculture Technology) 	AGT 1613 - Agricultural Records
S Agriculture & Natural Resources (CIP 01.0003)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> • (CIP 01.0102) Agricultural Business/Agribusiness • (CIP 01.0302) Agricultural Animal Science Technology/Production) • (CIP: 01.0304 – Field Crops) • (CIP: 01.1105 – Precision Agriculture Technology) 	AGT 1111 - Survey of Agriculture
S Concepts of Agriscience (CIP 01.9999) <u>OR</u> S Introduction to Agriscience (CIP 01.10001)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> • (CIP 01.0102) Agricultural Business/Agribusiness • (CIP 01.0302) Agricultural Animal Science Technology/Production) • (CIP: 01.0304) Field Crops • (CIP: 01.1105) Precision Agriculture Technology 	AGT 1111 - Survey of Agriculture

Precision Agriculture Technology Concentration

SEC Program	PS Program	PS Courses
S Agricultural & Environmental Science & Tech – Animals (CIP 02.0201)	PS Ag Business & Mgmt Technology <ul style="list-style-type: none"> (CIP 01.0302) Agricultural Animal Science Technology/Production) 	AGT 1214 - Applied Principles of Animal Production
S Agricultural & Environmental Science & Tech – Plants (CIP 02.0401)	PS Ag Business & Mgmt Technology <ul style="list-style-type: none"> (CIP: 01.0304 – Field Crops) 	AGT 1313 - Applied Principles of Plant Production
S Agricultural & Environmental Science & Tech - Agribusiness and Entrepreneurship Technology (CIP 01.0103)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302) Agricultural Animal Science Technology/Production) (CIP: 01.0304 – Field Crops) (CIP: 01.1105 – Precision Agriculture Technology) 	AGT 1613 - Agricultural Records
S Agriculture & Natural Resources (CIP 01.0003)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302) Agricultural Animal Science Technology/Production) (CIP: 01.0304 – Field Crops) (CIP: 01.1105 – Precision Agriculture Technology) 	AGT 1111 - Survey of Agriculture
S Concepts of Agriscience (CIP 01.9999) OR S Introduction to Agriscience (CIP 01.10001)	PS Ag Business & Mgmt Tech <ul style="list-style-type: none"> (CIP 01.0102) Agricultural Business/Agribusiness (CIP 01.0302) Agricultural Animal Science Technology/Production) (CIP: 01.0304) Field Crops (CIP: 01.1105) Precision Agriculture Technology 	AGT 1111 - Survey of Agriculture

TECHNICAL SKILLS ASSESSMENT

Colleges should report the following for students who complete the program with a career certificate, technical certificate, or an Associate of Applied Science Degrees for technical skills attainment:

MS CPAS – 2 Postsecondary Agricultural Business and Management Technology test

ONLINE AND BLENDED LEARNING OPPORTUNITIES

Course content includes lecture and laboratory semester credit hours. Faculty members are encouraged to present lecture related content to students in an online or blended learning environment. Training related to online and blended learning will be available to faculty members through the MS Community College Board.

INSTRUCTIONAL STRATEGIES

The Career Cluster Resources for Agriculture, Food and Natural Resources, as published by the National Association of State Directors of Career and Technical Education Consortium standards were adopted and provide instructional strategies to faculty members implementing the curriculum.

ASSESSMENT STRATEGIES

The Career Cluster Resources for Agriculture, Food and Natural Resources, as published by the National Association of State Directors of Career and Technical Education Consortium standards provide assessment strategies to faculty members implementing the curriculum. Additionally, standards were included in course content when appropriate.

RESEARCH ABSTRACT

The curriculum framework in this document reflects the changes in the workplace and a number of other factors that impact local vocational–technical programs. Federal and state legislation calls for articulation between high school and community college programs, integration of academic and vocational skills, and the development of sequential courses of study that provide students with the optimum educational path for achieving successful employment. National skills standards, developed by industry groups and sponsored by the U.S. Department of Education and Labor, provide vocational educators with the expectations of employers across the United States. All of these factors are reflected in the framework found in this document.

This curriculum was last validated and approved in 2009. In the spring of 2015, the Office of Curriculum and Instruction (OCI) met with several different business and industries in Central MS, Northern MS and Southern MS. Program faculty, administrators, and industry members were consulted regarding industry workforce needs and trends. An industry questionnaire was used to gather feedback concerning the trends and needs, both current and future, of their field. Industry members stated the curriculum was strong, but wanted to encourage students who complete the program to continue becoming certified in additional agricultural areas.

Several specific changes were made in the 2015 framework. The Animal Husbandry program of study was retitled Animal Science Technology in response to industry members’ suggestions for updating the terminology used in the field. Industry members also expressed the need for a poultry option. Therefore, the Animal Science Technology program now offers both an Animal Science Technology Beef Option technical certificate and an Animal Science Technology Poultry Option technical certificate option with appropriate new coursework added to the framework. Agribusiness Management Technology outlined a Vegetable Production technical certificate option to meet the needs of industry members.

REVISION HISTORY

2009-Research & Curriculum Unit, Mississippi State University

2015-Office of Curriculum & Instruction, Mississippi Community College Board

PROGRAM DESCRIPTIONS

Agribusiness Management Concentration

The Agribusiness Management option is a program designed to provide students with training in a variety of agriculturally related areas. The program is designed for students desiring to enter the broad range of jobs related to the management of agricultural enterprises and the marketing and sales of agricultural supplies and products. The program involves both technical and academic courses, with provisions for related activities along with on-the-job training (internships).

Emphasis is placed on plant, animal, and soil sciences, along with training in management techniques in production, marketing, and sales. Competencies and objectives for the courses in this program have been correlated to the knowledge and skill statements as listed in *Career Cluster Resources for Agriculture, Food and Natural Resources* as published by the National Association of State Directors of Career and Technical Education Consortium.

The Associate of Applied Science degree is awarded upon successful completion of 60 semester credit hours of coursework. Students completing the following 30 semester credit hours are eligible to receive a certificate in Agriculture Business and Management.

Animal Science Technology Concentration

The Animal Science Technology Concentration of Agriculture Business and Management Technology are designed to prepare the student for a career in the Animal Science Technology industry. Students will receive instruction in feeding, breeding, management, and health care of cattle, sheep, horses, swine, and poultry. In addition, the student will complete course work dealing with agricultural business management, marketing, record keeping, feed crops, and soils. Competencies and objectives for the courses in this program have been correlated to the knowledge and skill statements as listed in *Career Cluster Resources for Agriculture, Food and Natural Resources* as published by the National Association of State Directors of Career and Technical Education Consortium.

The Associate of Applied Science degree may be granted to students who complete a minimum of 60 semester credit hours of course work in the program. Upon completion of the following 30 semester credit hours, the student may receive a certificate in Agriculture Business and Management:

Field Crops Concentration

The Field Crops Concentration of the Agriculture Business and Management Technology program is designed to provide students with a common core of management skills and additional training related to the production of agricultural crops. Emphasis in the second year is placed on production of field crops and weed and insect control. This program relies upon computerized agricultural business simulations. Elective courses in the second year allow the students to tailor their educational programs to their occupational objectives. Competencies and objectives for the courses in this program have been correlated to the knowledge and skill statements as listed in *Career Cluster Resources for Agriculture, Food, and Natural Resources* as published by the National Association of State Directors of Career and Technical Education Consortium.

The Associate of Applied Science degree is awarded upon successful completion of a minimum of 60 semester credit hours. Students completing the following 30 semester credit hours are eligible to receive a certificate in Agricultural Business and Management.

Precision Agriculture Technology Concentration

Recent developments in entomology, plant pathology, and weed science in conjunction with advanced technologies such as remote sensing, global navigation satellite systems (GNSS), geographic information systems, and variable rate technology are dynamically influencing agricultural productivity. In addition, the implementation of these technologies can greatly improve environmental quality by reducing the volume of agricultural chemicals applied. The emergence of these technologies has increased the demand for technically trained workers.

Competencies and objectives for the courses in this program have been correlated to the knowledge and skill statements as listed in *Career Cluster Resources for Agriculture, Food, and Natural Resources* as published by the National Association of State Directors of Career and Technical Education Consortium.

Upon completion of this associate degree program, graduates will possess a working knowledge of these emerging technologies as well as practical hands-on experience in their application and use.

SUGGESTED COURSE SEQUENCE

Agribusiness Management Concentration Accelerated Pathway Credential

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information Certification Name
			Lecture	Lab		Lecture	Lab	
AGT 1111 OR AGR 1111	Survey of Agricultural Technology	1	1		15	15		
AGT 1214 OR AGR 1214	Applied Principles of Animal Production OR Animal Science	4	3	2	75	45	30	
AGT 1313 OR AGR 1313	Applied Principles of Plant Production OR Plant Science	3	2	2	60	30	30	
	Electives	7						
	TOTAL	15	6	4	150	90	60	

Agribusiness Management Concentration Career Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information Certification Name
			Lecture	Lab		Lecture	Lab	
AGT 1111 OR AGR 1111	Survey of Agricultural Technology	1	1		15	15		
AGT 1214 OR AGR 1214	Applied Principles of Animal Production OR Animal Science	4	3	2	75	45	30	
AGT 1313 OR AGR 1313 OR BIO 1314	Applied Principles of Plant Production OR Plant Science OR Botany I	3	2	2	60	30	30	
AGT 1413 OR AGR 2413	Principles of Agricultural Management OR Farm Management	3	2	2	60	30	30	
AGT 1714 OR AGR 2314	Applied Soils – Conservation and Use OR Basic Soils	4	3	2	75	45	30	
	Instructor Approved Electives per Local Community College	15						
	TOTAL	30	11	8	285	165	120	

* AGR 2713 Principles of Agricultural Economics, ECO 2113 Principles of Economics Macroeconomics, or ECO 2123 Principles of Economics Microeconomics may be taken in lieu of AGT 2263 Applied Agricultural Economics

**Agribusiness Management Concentration
Technical Certificate Required Courses**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
AGT 1613	Agricultural Records	3	2	2	60	30	30	
AGT 2263	Applied Agricultural Economics *	3	3		45	45		
AGT 1513	Principles of Agricultural Marketing	3	3		45	45		
	Instructor Approved Electives	6						
TOTAL		15	8	2	150	120	30	

* AGR 2713 Principles of Agricultural Economics, ECO 2113 Principles of Economics Macroeconomics, or ECO 2123 Principles of Economics Microeconomics may be taken in lieu of AGT 2263 Applied Agricultural Economics

**Agribusiness Management Concentration – Vegetable Production Option
Technical Certificate Required Courses**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
AGT 1613	Agricultural Records	3	2	2	60	30	30	
AGT 2263	Applied Agricultural Economics *	3	3		45	45		
AGR 1333 OR AGT 1333	Vegetable Production	3	2	2	60	30	30	
AGT 1513	Principles of Agricultural Marketing	3	3		45	45		
	Instructor Approved Electives	3						
TOTAL		15	10	4	210	150	60	

* AGR 2713 Principles of Agricultural Economics, ECO 2113 Principles of Economics Macroeconomics, or ECO 2123 Principles of Economics Microeconomics may be taken in lieu of AGT 2263 Applied Agricultural Economics

General Education Core Courses

To receive the Associate of Applied Science Degree, a student must complete all of the required coursework found in the Career Certificate option, Technical Certificate option and a minimum of 15 semester hours of General Education Core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college. The Southern Association of Colleges and Schools (SACS) Commission on Colleges Standard 2.7.3 from the Principles of Accreditation: Foundations for Quality Enhancement¹ describes the general education core.

Section 2.7.3 In each undergraduate degree program, the institution requires the successful completion of a general education component at the collegiate level that (1) is substantial component of each undergraduate degree, (2) ensures breadth of knowledge, and (3) is based on a coherent rationale. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours or the equivalent. These credit hours are to be drawn from and include at least one course from the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. The courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

**Agribusiness Management Concentration
General Education Courses**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	
	Humanities/Fine Arts	3	3		45	45		
	Social/Behavioral Science	3	3		45	45		
	Math/Science	3	3		45	45		
	Other academic courses per local community college requirements for AAS degree.	6						
TOTAL		15			180	180		

**Agribusiness Management Concentration
Electives**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Contact Hours	Contact Hour Breakdown			Certification Information
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship	Certification Name
ACC 1213	Principles of Accounting I	3	3			45	45			
AGR 1333	Vegetable Production	3	3			45	45			
AGR 1413	Farm Machinery	3	2	2		60	30	30		
AGR 2314	Basic Soils	3	2	2		60	30	30		
AGR 2613	Poultry Production	3	3			45	45			
AGR 2713	Principles of Agricultural Economics	3	2	2		60	30	30		
AGT 1163	Introduction to Spatial Information Systems	3	3			45	45			
AGT 1333	Vegetable Crop Production	3	2	2		60	30	30		
AGT 1613	Agricultural Records	3	2	2		60	30	30		
AGT 1813	Fitting/Grooming/Judging	3	2	2		60	30	30		
AGT 2213	Agricultural Sales	3	2	2		60	30	30		
AGT 2263	Applied Agricultural Economics***	3	2	2		60	30	30		
AGT 2363	Crop Production – General	3	2	2		60	30	30		
AGT 2483	Agricultural Pest Management	3	2	2		60	30	30		
AGT 2513	Management of Commercial Layers	3	3			45	45			
AGT 2523	Introduction to Poultry Production	3	3			45	45			
AGT 2533	Poultry Nutrition	3	3			45	45			
AGT 2543	Hatchery/Feed Mill Management	3	3			45	45			
AGT 2553	Broiler Production	3	3			45	45			
AGT 2573	Broiler Processing	3	2	2		60	30	30		
AGT 2823	Fish Management	3	2	2		60	30	30		
AGT 2563	Agricultural Machinery and Shop Management *	3	2	2		60	30	30		
AGT 2613	Forage and Pasture Crops	3	2	2		60	30	30		

AGT 2663	Applied Animal Nutrition	3	2	2		60	30	30		
AGT 2713	Beef Production I	3	2	2		60	30	30		
AGT 2723	Beef Production II	3	2	2		60	30	30		
AGT 2813	Swine Production	3	2	2		60	30	30		
AGT 2863	Horse Production	3	2	2		60	30	30		
AGT 291 (1-3)	Special Problem in Agriculture Business and Management	1-3		2-6		30-90		30-90		
AGT 292(1-6)	Supervised Agricultural Experience	1-6			3-18	45-270			45-270	
ATE 1113	Science and Technology	3	3							
BAD 1313	Business Mathematics	3	3							
BAD 2413	Business Law	3	3							
BOT 1313	Applied Business Mathematics	3								
CPT 1113	Fundamentals of Microcomputer Applications **	3	3			45	45			
CSC 1113	Introduction to Computer Concepts	3	3			45	45			
DDT 1413	Elementary Surveying	3	3			45	45			
ECO 2113	Principles of Economics (Macroeconomics)	3	3			45	45			
ECO 2123	Principles of Economics (Microeconomics)	3	3			45	45			
FOT 2124	Forest Surveying	4	3	2		75	45	30		
MTV 1214	Identification of Wholesale & Retail Cuts	4								
WBL 191(1-3) WBL 192(1-3) WBL 193(1-3) WBL 291(1-3) WBL 292(1-3) WBL 293(1-3)	Work Based Learning	1-3			3-18	45-270			45-270	
	Other Instructor Approved Elective(s)									

* AGR 1413 Farm Machinery may be taken in lieu of AGT 2563 Agricultural Machinery and Shop Management

- ** CSC 1123 Microcomputer Applications or ATE 1113 Science and Technology may be taken in lieu of CPT 1113
- *** AGR 2713 Principles of Agricultural Economics, ECO 2113 Principles of Macroeconomics, or ECO 2123 Principles of Microeconomics may be taken in lieu of AGT 2263 Applied Agricultural Economics

SUGGESTED COURSE SEQUENCE

Animal Science Technology

Accelerated Pathway Credential

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
AGT 1111 <u>OR</u> AGR 1111	Survey of Agricultural Technology	1	1		15	15		
AGT 1214 <u>OR</u> AGR 1214	Applied Principles of Animal Production <u>OR</u> Animal Science	4	3	2	75	45	30	
AGT 1313 <u>OR</u> AGR 1313	Applied Principles of Plant Production <u>OR</u> Plant Science	3	2	2	60	30	30	
	Instructor Approved Electives	7						
	TOTAL	15	6	4	150	90	60	

Animal Science Technology

Career Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
AGT 1111 <u>OR</u> AGR 1111	Survey of Agricultural Technology	1	1		15	15		
AGT 1214 <u>OR</u> AGR 1214	Applied Principles of Animal Production <u>OR</u> Animal Science	4	3	2	75	45	30	
AGT 1313 <u>OR</u> AGR 1313 <u>OR</u> BIO 1314	Applied Principles of Plant Production <u>OR</u> Plant Science <u>OR</u> Botany I	3	2	2	60	30	30	
AGT 1413 <u>OR</u> AGR 2413	Principles of Agricultural Management <u>OR</u> Farm Management	3	2	2	60	30	30	
AGT 1513	Principles of Agricultural Marketing	3	3		45	45		
AGT 1714 <u>OR</u> AGR 2314	Applied Soils – Conservation and Use <u>OR</u> Basic Soils	4	3	2	75	45	30	

AGT 1613	Agricultural Records	3	2	2	60	30	30	
	Instructor Approved Electives per Local Community College	9						
TOTAL		30	16	10	390	240	150	

** CSC 1123 Microcomputer Applications or ATE 1113 Science and Technology may be taken in lieu of CPT 1113

Animal Science Technology – Beef Option

Technical Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	
AGT 2663	Applied Animal Nutrition	3	2	2	60	30	30	
AGT 1913	Animal Reproduction	3	2	2	60	30	30	
AGT 2613	Forage and Pasture Crops	3	2	2	60	30	30	
	Instructor Approved Technical Electives	6						
TOTAL		15	6	6	180	90	90	

Animal Science Technology – Poultry Option

Technical Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	
AGT 2523	Introduction to Poultry Production	3	3	0	45	45	0	
AGT 2533	Poultry Nutrition	3	2	2	60	30	30	
AGT 2543	Hatchery/Feed Mill Management	3	3		45	45		
	Instructor Approved Technical Electives	6						
TOTAL		15		6	180	90	90	

General Education Core Courses

To receive the Associate of Applied Science Degree, a student must complete all of the required coursework found in the Career Certificate option, Technical Certificate option and a minimum of 15 semester hours of General Education Core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college. The Southern Association of Colleges and Schools (SACS) Commission on Colleges

Standard 2.7.3 from the Principles of Accreditation: Foundations for Quality Enhancement² describes the general education core.

Section 2.7.3 In each undergraduate degree program, the institution requires the successful completion of a general education component at the collegiate level that (1) is substantial component of each undergraduate degree, (2) ensures breadth of knowledge, and (3) is based on a coherent rationale. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours or the equivalent. These credit hours are to be drawn from and include at least one course from the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. The courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

**Animal Science Technology Concentration
General Education Courses**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
	Humanities/Fine Arts	3	3					
	Social/Behavioral Science	3	3					
	Math/Science	3	3					
	Other academic courses per local community college requirements for AAS degree.	6						
TOTAL		15						

²

Southern Association of Colleges and Schools Commission on Colleges. (2012). *The principles of accreditation: Foundations for quality enhancement*. Retrieved from <http://www.sacscoc.org/pdf/2012PrinciplesOfAccreditation.pdf>

**Animal Science Technology Concentration
Electives**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Contact Hours	Contact Hour Breakdown			Certification Information
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship	Certification Name
ACC 1213	Principles of Accounting I	3	3			45	45			
AGR 1413	Farm Machinery	3	2	2		60	30	30		
AGR 2613	Poultry Production	3	2	2		60	30	30		
AGR 2713	Principles of Agricultural Economics	3	2	2		60	30	30		
AGT 1163	Introduction to Spatial Information Systems	3	2	2		60	30	30		
AGT 1613	Agricultural Records	3	2	2		60	30	30		
AGT 1813	Fitting/Grooming/Judging	3	2	2		60	30	30		
AGT 1913	Animal Reproduction	3	2	2		60	30	30		
AGT 2213	Agricultural Sales	3	2	2		60	30	30		
AGT 2263	Applied Agricultural Economics*	3	2	2		60	30	30		
AGT 2363	Crop Production – General	3	2	2		60	30	30		
AGT 2483	Agricultural Pest Management	3	2	2		60	30	30		
AGT 2513	Management of Commercial Layers	3	3			45	45			
AGT 2523	Introduction to Poultry Production	3	3			45	45			
AGT 2533	Poultry Nutrition	3	3			45	45			
AGT 2543	Hatchery/Feed Mill Management	3	3			45	45			
AGT 2553	Broiler Production	3	3			45	45			
AGT 2563	Agricultural Machinery and Shop Management	3	2	2		60	30	30		
AGT 2573	Broiler Processing	3	2	2		60	30	30		
AGT 2583	Poultry Production & Processing Internship	3	3			45	45			
AGT 2613	Forage and Pasture Crops	3	2	2		60	30	30		
AGT 2663	Applied Animal Nutrition	3	2	2		60	30	30		
AGT 2713	Beef Production I	3	2	2		60	30	30		
AGT 2723	Beef Production II	3	2	2		60	30	30		
AGT 2813	Swine Production	3	2	2		60	30	30		
AGT 2863	Horse Production	3	2	2		60	30	30		
MTV 1214	Identification of Wholesale & Retail Cuts	4								

AGT 291 (1-3)	Special Problem in Agriculture Business and Management	1-3		2-6		30-90		30-90	
AGT 292 (1-6)	Supervised Agricultural Experience	1-6			3-18	45-270			45-270
AIT 1813	Equipment Servicing, Cutting, and Welding	3							
ATE 1113	Science and Technology	3	3			45	45		
BAD 1313	Business Mathematics	3	3			45	45		
CSC 1113	Introduction to Computer Concepts	3	3			45	45		
ECO 2113	Principles of Economics (Macroeconomics)	3	3			45	45		
ECO 2123	Principles of Economics (Microeconomics)	3	3			45	45		
WBL 191(1-3) WBL 192(1-3) WBL 193(1-3) WBL 291(1-3) WBL 292(1-3) WBL 293(1-3)	Work-Based Learning	1-3			3-18	45-270			45-270
	Other Instructor Approved Elective(s)								

*AGR 2713 Principles of Agricultural Economics, ECO 2113 Principles of Macroeconomics, or ECO 2123 Principles of Microeconomics may be taken in lieu of AGT 2263 Applied Agricultural Economics

SUGGESTED COURSE SEQUENCE

Field Crops Concentration

Accelerated Pathway Credential

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
AGT 1111 OR AGR 1111	Survey of Agricultural Technology	1	1		15	15		
AGT 1163	Spatial Information Systems	3	2	2	60	30	30	
AGR 2314	Basic Soils	4	3	2	75	45	30	
	Electives	7						
	TOTAL	15	6	4	150	90	60	

Field Crops Concentration

Career Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
AGT 1111 OR AGR 1111	Survey of Agricultural Technology	1	1		15	15		
AGT 1163	Spatial Information Systems	3	2	2	60	30	30	
AGR 2314 OR AGR 1714	Basic Soils OR Applied Soils Conservation and Use	4	3	2	75	45	30	
AGR 2413 OR AGR 1413	Farm Management OR Principles of Agricultural Management	3	2	2	60	30	30	
AGT 1214 OR AGR 1214	Applied Principles of Animal Production OR Animal Science	4	3	2	75	45	30	
AGT 1313 OR AGR 1313	Applied Principles of Plant Production OR Plant Science	3	2	2	60	30	30	
AGR 1413 OR AGR 2563	Farm Machinery OR Agricultural Machinery and Shop Management	3	2	2	60	30	30	
AGT 1513	Principles of Agricultural Marketing	3	2	2	60	30	30	
AGT 2263 OR AGR 2713	Applied Agricultural Economics OR Principles of Agricultural Economics	3	2	2	60	30	30	
	Instructor Approved Electives per Local Community College	3						
	TOTAL	30	19	16	525	285	240	

* CSC 1123 Microcomputer Applications or ATE 1113 Science and Technology may be taken in lieu of CPT 1113

** ECO 2113 Principles of Economics Macroeconomics, or ECO 2123 Principles of Economics Microeconomics may be taken in lieu of AGT 2263 Applied Agricultural Economics or AGR 2713 Principles of Agricultural Economics

Field Crops Concentration

Technical Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
AGT 2373	Fiber and Oilseed Crops	3	2	2	60	30	30	
AGT 2383	Grain Crops	3	2	2	60	30	30	
AGT 2413	Weed Control	3	2	2	60	30	30	
AGT 2463	Insects and Controls	3	2	2	60	30	30	
	Approved Technical Electives	3						
TOTAL		15	8	8	240	120	120	

General Education Core Courses

To receive the Associate of Applied Science Degree, a student must complete all of the required coursework found in the Career Certificate option, Technical Certificate option and a minimum of 15 semester hours of General Education Core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college. The Southern Association of Colleges and Schools (SACS) Commission on Colleges Standard 2.7.3 from the Principles of Accreditation: Foundations for Quality Enhancement³ describes the general education core.

Section 2.7.3 In each undergraduate degree program, the institution requires the successful completion of a general education component at the collegiate level that (1) is substantial component of each undergraduate degree, (2) ensures breadth of knowledge, and (3) is based on a coherent rationale. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours or the equivalent. These credit hours are to be drawn from and include at least one course from the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. The courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

³

Southern Association of Colleges and Schools Commission on Colleges. (2012). *The principles of accreditation: Foundations for quality enhancement*. Retrieved from <http://www.sacscoc.org/pdf/2012PrinciplesOfAccreditation.pdf>

Field Crops Concentration
General Education Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
	Humanities/Fine Arts	3	3		45	45		
	Social/Behavioral Science	3	3		45	45		
	Math/Science	3	3		45	45		
	Other academic courses per local community college requirements for AAS degree.	6						
TOTAL		15						

**Field Crops Concentration
Electives**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Contact Hours	Contact Hour Breakdown			Certification Information
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship	Certification Name
ACC 1213	Principles of Accounting I	3	3			45	45			
AGR 1111	Survey of Agricultural Technology	1	1			15	15			
AGR 1333	Vegetable Production	3	2	2		60	30	30		
AGR 2314	Basic Soils	4	3	2		75	45	30		
AGR 1413	Farm Machinery	3	2	2		60	30	30		
AGR 2613	Poultry Production	3	2	2		60	30	30		
AGR 2713	Principles of Agricultural Economics	3	2	2		60	30	30		
AGT 1163	Introduction to Spatial Information Systems	3	2	2		60	30	30		
AGT 1333	Vegetable Crop Production	3	2	2		60	30	30		
AGT 1613	Agricultural Records	3	2	2		60	30	30		
AGT 1714	Applied Soils – Conservation and Use	4	3	2		75	45	30		
AGT 2213	Agricultural Sales	3	2	2		60	30	30		
AGT 2263	Applied Agricultural Economics*	3	2	2		60	30	30		
AGT 2363	Crop Production – General	3	2	2		60	30	30		
AGT 2483	Agricultural Pest Management	3	2	2		60	30	30		
AGT 2513	Management of Commercial Layers	3	3			45	45			
AGT 2523	Introduction to Poultry Production	3	3			45	45			
AGT 2533	Poultry Nutrition	3	3			45	45			
AGT 2543	Hatchery/Feed Mill Management	3	3			45	45			
AGT 2553	Broiler Production	3	3			45	45			
AGT 2573	Broiler Processing	3	2	2		60	30	30		
AGT 2823	Fish Management	3	2	2		60	30	30		
AGT 2713	Beef Production I	3	2	2		60	30	30		

AGT 2723	Beef Production II	3	2	2		60	30	30		
AGT 291 (1-3)	Special Problem in Agriculture Business and Management	1-3		2-6				30- 90		
AGT 292 (1-6)	Supervised Agricultural Experience	1-6			3-18	45-270			45-270	
ATE 1113	Science and Technology	3	3			45	45			
BAD 1313	Business Mathematics	3	3			45	45			
BAD 2413	Business Law	3	3			45	45			
BOT 1313	Applied Business Mathematics	3	3			45	45			
CFT 1143	Water Quality Management	3	3			45	45			
CHE 1114	General Chemistry Survey – Basic	4	3	2		75	45	30		
CHE 1314	Principles of Chemistry I	4	3	2		75	45	30		
CPT 1113	Fundamentals of Microcomputers Application *	3	3			45	45			
CSC 1113	Introduction to Computer Concepts	3	3			45	45			
ECO 2113	Principles of Economics (Macroeconomics)	3	3			45	45			
ECO 2123	Principles of Economics (Microeconomics)	3	3			45	45			
HLT 2133	Entomology	3								
HLT 2143	Plant Pathology	3								
MTV 1214	Identification of Wholesale & Retail Cuts	4								
WBL 191(1-3) WBL 192(1-3) WBL 193(1-3) WBL 291(1-3) WBL	Work-Based Learning	1-3			3-18	45-270			45-270	

292(1-3) WBL 293(1-3)										
	Other Instructor Approved Elective(s)									

ECO 2113 Principles of Economics Macroeconomics, or ECO 2123 Principles of Economics Microeconomics may be taken in lieu of AGT 2263 Applied Agricultural Economics or AGR 2713 Principles of Agricultural Economics

SUGGESTED COURSE SEQUENCE

Precision Agriculture Technology Concentration Accelerated Pathway Credential

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	
AGR 1111 OR AGT 1111	Survey of Agricultural Technology	1	1		15	15		
AGT 1163	Spatial Information Systems	3	2	2	60	30	30	
AGT 1254	GNSS Data Collection	4	3	2	75	45	30	
	Electives	7						
	TOTAL	15	6	4	150	90	60	

Precision Agriculture Technology Concentration Career Certificate Required Courses

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	
AGR 1111 OR AGT 1111	Survey of Agricultural Technology	1	1		15	15		
AGT 1163	Introduction to Spatial Information Systems	3	2	2	60	30	30	
AGT 2413 OR AGT 2463	Weed Control OR Insect Control *	3	2	2	60	30	30	
AGT 1354	Remote Sensing	4	3	2	75	45	30	
AGT 1254	GNSS Data Collection	4	3	2	75	45	30	
AGT 2154	Geographic Information Systems I	4	3	2	75	45	30	
AGT 2434	Crop Management Zones	4	3	2	75	45	30	
	Any other instructor approved technical electives	7						
	TOTAL	30	17	12	435	255	180	

* May be substituted with HLT 2133 Entomology or HLT 2143 Plant Pathology.

**Precision Agriculture Technology Concentration
Technical Certificate Required Courses**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
AGT 2164	Variable Rate Technology	4	3	2	75	45	30	
AGT 2174	Agricultural Geographic Information Systems	4	3	2	75	45	30	
AGT 2474	Site Specific Pest Management	4	3	2	75	45	30	
	Any other instructor approved technical electives	3						
TOTAL		15	9	6	225	135	90	

General Education Core Courses

To receive the Associate of Applied Science Degree, a student must complete all of the required coursework found in the Career Certificate option, Technical Certificate option and a minimum of 15 semester hours of General Education Core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college. The Southern Association of Colleges and Schools (SACS) Commission on Colleges Standard 2.7.3 from the Principles of Accreditation: Foundations for Quality Enhancement⁴ describes the general education core.

Section 2.7.3 In each undergraduate degree program, the institution requires the successful completion of a general education component at the collegiate level that (1) is substantial component of each undergraduate degree, (2) ensures breadth of knowledge, and (3) is based on a coherent rationale. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours or the equivalent. These credit hours are to be drawn from and include at least one course from the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. The courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

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Southern Association of Colleges and Schools Commission on Colleges. (2012). *The principles of accreditation: Foundations for quality enhancement*. Retrieved from <http://www.sacscoc.org/pdf/2012PrinciplesOfAccreditation.pdf>

**Precision Agriculture Technology Concentration
General Education Courses**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown		Total Contact Hours	Contact Hour Breakdown		Certification Information
			Lecture	Lab		Lecture	Lab	Certification Name
	Humanities/Fine Arts	3	45		45	45		
	Social/Behavioral Science	3	45		45	45		
	Math/Science	3	45		45	45		
	Other academic courses per local community college requirements for AAS degree.	6						
TOTAL		15						

**Precision Agriculture Technology Concentration
Technical Electives**

Course Number	Course Name	Semester Credit Hours	SCH Breakdown			Total Contact Hours	Contact Hour Breakdown			Certification Information
			Lecture	Lab	Clinical/ Internship		Lecture	Lab	Clinical/ Internship	Certification Name
ACC 1213	Principles of Accounting	3	3			45	45			
AGR 1111	Survey of Agricultural Technology	1	1			15	15			
AGR 1333	Vegetable Production	3								
AGR 1413	Farm Machinery	3	2	2		60	30	30		
AGR 2713	Principles of Agricultural Economics	3	3			45	45			
AGT 1111	Survey of Agricultural Technology	1	1			15	15			
AGT 1333	Vegetable Crop Production	3	2	2		60	30	30		
AGT 2263	Applied Agricultural Economics*	3	2	2		60	30	30		
AGT 2363	Crop Production – General	3	2	2		60	30	30		
AGT 2373	Fiber and Oilseed Crops	3	2	2		60	30	30		
AGT 2383	Grain Crops	3	2	2		60	30	30		
AGT 2413	Weed Control	3	2	2		60	30	30		
AGT 2463	Insects and Controls	3	2	2		60	30	30		
AGT 2483	Agricultural Pest Management	3	2	2		60	30	30		
AGT 291 (1-3)	Special Problem in Agriculture Business and Management	1-3		2-6		30-90		30-90		
AGT 292 (1-6)	Supervised Agricultural Experience	1-6			3-18	45-270			45-270	
ANT 2613	Unmanned Aerial Systems Basic Flight Skill Development	3	2	2		60	30	30		
ANT 2623	Unmanned Aerial Systems Intermediate Flight Skill Development	3	2	2		60	30	30		
ANT 2633	Unmanned Aerial Systems Advanced Flight Skill	3	2	2		60	30	30		

	Development									
ANT 2643	Autonomous Systems	3	2	2		60	30	30		
DDT 1413	Elementary Surveying	3	1	4		75	15	60		
ECO 2113	Principles of Economics-Macroeconomics	3	3			45	45			
ECO 2123	Principles of Economics-Microeconomics	3	3			45	45			
BIO 1314	Botany I	4	3	2		75				
HLT 2133	Entomology	3								
HLT 2143	Plant Pathology	3								
PHY 2243	Physical Science Survey I	3	3			45	45			
PHY 2253	Physical Science Survey II	3	3			45	45			
WBL 191(1-3) WBL 192(1-3) WBL 193(1-3) WBL 291(1-3) WBL 292(1-3) WBL 293(1-3)	Work-Based Learning	1-3			3-18	45-270				45-270
	Other Instructor Approved Elective(s)									

* ECO 2113 Principles of Economics Macroeconomics, or ECO 2123 Principles of Economics Microeconomics may be taken in lieu of AGT 2263 Applied Agricultural Economics or AGR 2713 Principles of Agricultural Economics

COURSES

Course Number and Name: **AGT 1111 Survey of Agricultural Technology**

Description: The course provides opportunities for students to gain knowledge, practice, and study in agricultural technology. It includes lectures and seminars on current agricultural topics including government programs and policies, current technological trends and practices, international agriculture, agricultural leadership, and employment opportunities in the agribusiness field. Note: AGR 1111 Survey of Agricultural Technology may be substituted for this course.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
1	1	0	15

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Develop leadership and employability skills.
 - a. Prepare a job resume and a letter of application.
 - b. Indicate the effectiveness of good personal traits in the area of employment.
 - c. Practice a mock interview.
 - d. Develop and organize career development goals (from human relations).
 - e. Participate in an agricultural student association or local club activities.

2. Identify the major agriculture industries and their relationships to the agricultural community.
 - a. Compare the agriculture sector to the general economy.
 - b. Describe the scope and economic importance of the agribusiness sector, particularly as it relates to the state of Mississippi.
 - c. Describe and differentiate among the three sectors of the agribusiness industry.
 - d. Compile a listing of the agriculture related industries in the regional or local area.

3. Identify alternative crops.

National Agriculture, Food, and Natural Resources (AFNR) Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- COM 02 Employ technical communications effectively to maintain good records and reporting procedures.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SYS 01 Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
- SHE 01 Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.

- LEAD 01 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- ELR 01 Know and understand the statement: Importance of professional ethics and legal responsibilities.
- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.

Course Number and Name: AGT 1163 Introduction to Spatial Information Systems

Description: This course provides an overview of spatial information concepts and the tools of spatial information systems (GNSS, GIS, VRT, and remote sensing). Students will recognize the impact of spatial information technology on our lives currently and in the future. They will research potential career opportunities as they relate to the emerging technologies and the basic concepts under which spatial information functions.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe basic principles of the various technologies incorporated in spatial information systems including GNSS, GIS, VRT, and remote sensing.
 - a. Describe the global navigation satellite system (GNSS).
 - b. Describe the geographic information system (GIS).
 - c. Describe variable rate technology (VRT).
 - d. Describe remote sensing.
2. Describe how the global navigation satellite system (GNSS), the geographic information system (GIS), and remote sensing interact to benefit agriculture, forestry, transportation, urban planning, public health, law enforcement, and so forth.
 - a. Describe how GIS and GNSS are integrated for problem solving in a variety of disciplines.
 - b. Describe how remote sensing is applied into a GIS for problem solving in these disciplines.
3. Describe the use of spatial information technology in relationship to the environment.
 - a. Describe how spatial information systems are used to identify environmental problems.
 - b. Describe how spatial information systems are used to implement sound environmental practices.
4. Identify careers and opportunities in emerging spatial information industries.
 - a. Identify spatial information industries operating at the state, national, and international level.
 - b. Identify career opportunities in emerging spatial industries.
 - c. Describe activities of employees working with spatial information systems.

AFNR Career Cluster Content Standards

- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SYS 01 Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.

Course Number and Name: **AGT 1214** **Applied Principles of Animal Production**

Description: A course to provide students with basic principles related to the production of farm animals. This includes instruction in the basic production cycle, breeding, nutrition, and health of beef and dairy cattle, horses, hogs, poultry, and commercial aquaculture. Note: AGR 1214 Animal Science may be substituted for this course.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe the types of production cycle of livestock.
 - a. Identify and contrast the different sectors of beef cattle production.
 - b. Identify and contrast the different sectors of dairy cattle production.
 - c. Identify and contrast the different sectors of poultry production.
 - d. Identify and contrast the different sectors of swine production.
 - e. Identify and contrast the different sectors of sheep and goat production.
 - f. Identify and contrast the different sectors of horse production.

2. Describe and contrast the characteristics of different breeds of livestock.
 - a. Contrast the characteristics, qualities, and origins of beef cattle breeds.
 - b. Contrast the characteristics, qualities, and origins of dairy cattle breeds.
 - c. Contrast the characteristics, qualities, and origins of poultry breeds.
 - d. Contrast the characteristics, qualities, and origins of swine breeds.
 - e. Contrast the characteristics, qualities, and origins of sheep and goat breeds.
 - f. Contrast the characteristics, qualities, and origins of horse breeds.

3. Describe the reproductive processes of livestock.
 - a. Discuss the role of genetics in the reproduction and breeding process.
 - b. Compare the different systems of breeding animals.
 - c. Contrast the different systems of breeding poultry.
 - d. Describe factors that can be used for selection of individual animals in a breeding program.

4. Describe nutritive needs of livestock.
 - a. Describe the characteristics of the classes of nutrients, namely, fats, protein, water, carbohydrates, minerals, and vitamins.
 - b. Contrast differences in the digestive systems of cattle, poultry, swine, sheep, horses, and aquaculture.

5. Describe the importance of a livestock herd health program.
 - a. Identify signs and symptoms of animals infected with internal and external parasites.
 - b. Identify common diseases associated with the different species of livestock.

AFNR Career Cluster Content Standards

COM 01	Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
COM 02	Employ technical communications effectively to maintain good records and reporting procedures.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
ABS.02.	Utilize appropriate management planning principles in AFNR business enterprises.
ABS.03.	Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
ABS.04.	Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets, and credit for an AFNR business.
ABS.05.	Assess accomplishment of goals and objectives by an AFNR business.
ABS.06.	Use industry-accepted marketing practices to accomplish AFNR business objectives.
ABS.07.	Create a production system plan.
AS.01.	Examine the components, historical development, global implications, and future trends of the animal systems industry.
AS.02.	Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.
AS.03.	Provide for proper health care for animals.
AS.04.	Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
AS.05.	Evaluate and select animals based on scientific principles of animal production.
AS.06.	Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
AS.07.	Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.
AS.08.	Analyze environmental factors associated with animal production.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
FPP.01.	Examine components of the food industry and historical development of food products and processing.
FPP.02.	Apply safety principles, recommended equipment, and facility management techniques to the food products and processing industry.
FPP.03.	Apply principles of science to the food products and processing industry.
PS.01.	Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
PS.02.	Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
PS.03.	Propagate, culture, and harvest plants.

Course Number and Name: AGT 1254 GNSS Data Collection

Description: A course to introduce students to the general principles and history of Global Navigation Satellite Systems, their use, and realized and potential value in agriculture. Students will learn to acquire, import and export, and use geo-referenced data. The student will also be able to perform basic troubleshooting, grasp the concepts of spatial variability, and interpret different map projections.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Discuss operation of Global Navigation Satellite Systems (GNSS).
 - a. Describe the origination of the GNSS system and its hardware components.
 - b. Describe the data collected by the GNSS system and the data's accuracy.
 - c. Describe the uses of a GNSS system.
2. Discuss basic concepts of precision agriculture.
 - a. Describe basic concepts of precision agriculture and its relationship to GNSS, Geographic Information Systems (GIS), Variable Rate Technology (VTR), Remote Sensing (RS), and other PA technologies and tools.
 - b. Discuss spatial variability in data.
 - c. Discuss the economics of precision agriculture technology.
3. Explain basic concepts of maps and geodesy.
 - a. Design a map using the data from a GNSS system.
 - b. Describe coordinates, projections, and datum.
 - c. Discuss geo-rectification and ortho-rectification.
4. Identify GNSS equipment and software used in precision agriculture operations.
 - a. Research and select GNSS hardware and software.
 - b. Use and troubleshoot GNSS hardware and software.
5. Collect and apply GNSS data for use in navigation and mapping of agricultural interests.
 - a. Collect GNSS data and use for navigation and mapping of agricultural interests.
 - b. Input GNSS data into a geographic information system.
 - c. Use GNSS data to navigate.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- COM 02 Employ technical communications effectively to maintain good records and reporting procedures.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.

- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SYS 01 Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- ESS.01. Use analytical procedures to plan and evaluate environmental service systems.
- ESS.02. Assess the impact of policies and regulations on environmental service systems.
- ESS.06. Use tools, equipment, machinery, and technology to accomplish tasks in environmental service systems.
- PST.01. Use physical science principles and engineering applications with power, structural and technical systems to solve problems and improve performance.
- PST.02. Design, operate and maintain mechanical equipment, structures, biological systems, land treatment, power and technology.
- PST.05 Apply technology principles in the use of agricultural technical systems.

Course Number and Name: AGT 1313 Applied Principles of Plant Production

Description: A course to provide information related to the growth, nutrition, and general culture of agricultural and horticultural crops. It includes instruction on photosynthesis and transpiration, plant nutrition, pest control, and reproduction. Note: AGR 1313 Plant Science or BIO 1314 Botany I may be substituted for this course.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe the interrelationship of the major parts of a plant and how they have adapted to the environment.
 - a. Describe the interrelationship of plant roots, stems, and leaves and how they have adapted to the environment.
2. Identify the components of a typical plant cell, and describe their function(s).
 - a. Identify the structure and function of each plant cell organelle.
 - b. Describe the different tissue systems of plants.
3. Describe the processes and interrelationship of photosynthesis and respiration in green plants.
 - a. Explain the effects of temperature, light, water, and air on green plants.
 - b. Discuss the translocation of water from the roots to the leaves.
4. Describe the methods of weed, insect, and plant disease control.
 - a. Describe different methods of pest control (chemical, mechanical, cultural, and biological).
 - b. Identify the different types of plant pests.
 - c. Describe the damage caused by agricultural crop pests.
5. Describe the genetics of plant breeding.
 - a. Describe the advantages and disadvantages of sexual and asexual reproduction.
 - b. Describe the creation of new varieties through plant breeding (hybrids).
6. Explain the nutritional requirements for plants.
 - a. Describe the functions of micronutrients and macronutrients in plants.
 - b. Compare the advantages and disadvantages of chemical and organic fertilizers.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SYS 01 Understand roles within teams, work units, departments, organizations, interorganizational systems, and the larger environment.

- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- PS.01. Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
- PS.02. Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
- PS.03. Propagate, culture, and harvest plants.
- BS.01. Recognize the historical, social, cultural, and potential applications of biotechnology.
- BS.02. Demonstrate laboratory skills related to biotechnology.
- BS.03. Demonstrate the application of biotechnology to AFNR pathways.

Course Number and Name: AGT 1333 Vegetable Crop Production

Description: This course is a study of vegetable crop techniques including conventional and minimal tillage, greenhouse management, planting, pest control, harvesting, and physical marketing practices. Note: AGR 1333 Vegetable Production may be substituted for this course.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment: None

Pre-requisite: Instructor Approved

Student Learning Outcomes:

1. Identify the different types of vegetable crops to include the following:
 - a. Grass family
 - b. Allium family
 - c. Goosefoot family
 - d. Mustard family
 - e. Malvaceae family
 - f. Bindweed family
 - g. Pea family
 - h. Parsley family
 - i. Solanaceae family
 - j. Gourd family
 - k. Composite family
2. Identify natural resource/crop relationships.
 - a. Define the role that soil types play in vegetable crop selection and production.
 - b. Examine the different types of water management practices.
 - c. Determine the fertility levels for vegetable crop enterprises.
 - d. Apply techniques for greenhouse production.
3. Classify the different types of environmental problems experienced in vegetable crop production in Mississippi.
 - a. Identify weeds and alternative control measures.
 - b. Identify insects and alternative control measures available.
 - c. Identify plant diseases and factors affecting diseases for vegetable crops grown in Mississippi.
 - d. Discuss government regulation concerning the use of vegetable production practices that alter or impact the environment.
4. Explain the inputs used in vegetable crop production.
 - a. Measure the heat index in reference to vegetable production.
 - b. Observe vegetable growth stages.
 - c. Apply principles of climatic environment to vegetable growth.
 - d. Identify fertility needs for vegetable production.
 - e. Identify irrigation requirements for vegetable production.
5. Compare harvesting techniques used in vegetable production.
 - a. Discuss hand harvesting.
 - b. Discuss mechanical harvesting.

6. Identify marketing techniques used in the sale of vegetables.
 - a. Discuss contract production.
 - b. Discuss on the farm sales.
 - c. Discuss farmers markets.

AFNR Career Cluster Content Standards

ACAD 01	Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
COM 01	Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
TECH 01	Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
ABS.01.	Utilize economic principles to establish and manage and AFNR business environment.
ABS.06.	Use industry-accepted marketing practices to accomplish AFNR business objectives.
ABS.07.	Create a production system plan.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
FPP.03.	Apply principles of science to the food products and processing industry.
NRS.01.	Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
NRS.02.	Apply scientific principles to natural resource management activities.
NRS.03.	Apply knowledge of natural resources industries to production and processing industries.
NRS.04.	Demonstrate techniques used to protect natural resources.
NRS.05.	Use effective methods and venues to communicate natural resource processes to the public.
PS.01.	Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
PS.02.	Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
PS.03.	Propagate, culture, and harvest plants.
PS.04.	Employ elements of design to enhance an environment.

Course Number and Name: AGT 1354 Remote Sensing

Description: This course provides an overview of remote sensing technologies for agricultural operations. The course will emphasize basic concepts and satellite-based, airborne, and ground-based sensing methods. Digital image interpretation and analysis will be a major component. The student will understand how remote sensing is used with spatial information and variable-rate technologies for precision agriculture management.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe fundamental principles of remote sensing.
 - a. Describe the general background of remote sensing applications.
 - b. Discuss the fundamental characteristics of electromagnetic radiation-light, heat, and radio waves.
 - c. Discuss fundamental energy interactions including reflected, absorbed, and transmitted energy.
 - d. Define reflectance and thermal properties of surfaces.
 - e. Describe how remote sensing is used with Geographic Information Systems (GISs).
2. Discuss remote sensing platforms and characteristics of imagery.
 - a. Summarize sources of remotely sensed imagery, including availability and how to obtain.
 - b. Identify characteristics of satellite imagery from platforms such as GEOEYE-1, LANDSAT (MSS, TM), SPOT, IKONOS, and TRWIS.
 - c. Identify the characteristics of airborne platforms including RDACS, AVIRIS, and ADAR.
 - d. Identify characteristics of aerial videography and photography.
 - e. Describe the applications of active sensors such as synthetic aperture radar (SAR) and LIDAR.
 - f. Discuss UAS (Unmanned Aerial Systems) trends and standards.
3. Describe the characteristics of nonphotographic passive systems.
 - a. Discuss multispectral and hyper-spectral scanners including different types, characteristics, advantages over photographic systems, and calibration issues.
 - b. Discuss the types, characteristics, and advantages of thermal scanners.
 - c. Discuss the types, characteristics, and advantages of ground-based spectroradiometers and their utility in agricultural management.
 - d. Discuss the characteristics and advantages of ground-based thermal sensing.
4. Develop skills in image interpretation, processing, analysis, and classification.
 - a. Identify factors, landmarks, and characteristics to examine in interpreting images.
 - b. Discuss rectification and image enhancement processes including ground control selection, re-sampling, mosaicing methods, and GNSS location interfacing.
 - c. Describe the sources, features, and limitations of low-cost or free image processing and analysis software.

5. Examine data collection and processing processes for airborne remote sensing.
 - a. Discuss collection of data using digital photography from an airborne platform.
 - b. Describe the process for setting ground control points in the field.
 - c. Discuss the processing, enhancement, and classification of an image to extract features of interest using graphics packages and image analysis software.
 - d. Discuss the process for geo-referencing and registering an image using a GIS.
 - e. Discuss the process for exporting remote sensing data to a variable-rate sprayer for real-time precision management.

AFNR Career Cluster Content Standards

ACAD 01	Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
COM 01	Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
COM 02	Employ technical communications effectively to maintain good records and reporting procedures.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SYS 01	Understand roles within teams, work units, departments, organizations, interorganizational systems, and the larger environment.
TECH 01	Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
ESS.01.	Use analytical procedures to plan and evaluate environmental service systems.
ESS.02.	Assess the impact of policies and regulations on environmental service systems.
ESS.06.	Use tools, equipment, machinery, and technology to accomplish tasks in environmental service systems.
PST.01.	Use physical science principles and engineering applications with power, structural and technical systems to solve problems and improve performance.
PST.02.	Design, operate and maintain mechanical equipment, structures, biological systems, land treatment, power and technology.
PST.05	Apply technology principles in the use of agricultural technical systems.

Course Number and Name: AGT 1413 Principles of Agricultural Management

Description: A course that provides instruction in organization and structure of agricultural businesses, decision making, and the planning process for farming operations. Note: AGR 2413 Farm Management may be taken in lieu of this course.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Explain the role and function of management in an agricultural production system.
 - a. Describe management skills needed to operate an agricultural business.
 - b. Explain and differentiate among the functions of planning, organizing, directing, and controlling in an agricultural business.
 - c. Discuss the characteristics of problems and decision making in agriculture, and understand the steps in the planning process.
2. Identify the most important factors to consider when selecting an organizational structure for an agribusiness.
 - a. Develop an understanding, and list the advantages and disadvantages of the sole proprietorship, partnerships, corporations, and limited liability companies as forms of business organizations available to agribusiness.
 - b. Identify how taxes affect the form of business organizations.
 - c. Describe the involvement of cooperatives in the agribusiness industries today.
3. Describe the use and importance of financial statements in the management practice of agribusiness today.
 - a. Develop a balance sheet and an income statement, and illustrate how agribusiness managers utilize these financial statements today.
 - b. Develop a statement of owner's equity and a statement of cash flows and illustrate how agribusiness managers utilize these financial statements today.
 - c. Calculate and analyze financial statement ratios and explain how they can aid the decision-making process for an agribusiness manager.
4. Discuss the different aspects of financing the agribusiness.
 - a. List the reasons why an agribusiness manager might choose to increase its financial resources.
 - b. List and discuss the different methods of external sources of financing.
 - c. Describe the use of equity capital as a means of internally financing an agribusiness.
 - d. Discuss the advantages and disadvantages of leasing alternatives in agribusiness today.
5. Perform whole farm planning and budgeting.
 - a. Develop inventory formats for various agricultural resources.
 - b. Develop a resource use plan identifying the difference between long-term and short-term planning.
 - c. Incorporate tax management strategies into developing production plans.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- ELR 01 Know and understand the statement: Importance of professional ethics and legal responsibilities.
- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- ABS.01. Utilize economic principles to establish and manage and AFNR business environment.
- ABS.02. Utilize appropriate management planning principles in AFNR business enterprises.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
- ABS.04. Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets, and credit for an AFNR business.
- ABS.05. Assess accomplishment of goals and objectives by an AFNR business.
- ABS.06. Use industry-accepted marketing practices to accomplish AFNR business objectives.
- ABS.07. Create a production system plan.
- FPP.04. Select and process food products for storage, distribution, and consumption.

Course Number and Name: **AGT 1513** **Principles of Agricultural Marketing**

Description: An introduction to general principles of marketing agricultural products. This course includes instruction in general marketing practices and the use of futures contracts.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment: None

Pre-requisite: Instructor Approved

Student Learning Outcomes:

1. Describe how a marketing system develops.
 - a. Define marketing as it refers to agricultural commodities.
 - b. Discuss the development of organized marketing.
 - c. Identify the technical components of marketing.
 - d. Discuss the role of information in marketing including modern satellite and computer systems.

2. Identify the factors that affect basic commodity prices.
 - a. Describe price determination as it relates to the forces of supply and demand.
 - b. Discuss the difference between farm and consumer prices.
 - c. Discuss the fallacy of composition and the dangers associated with rapid response to price changes with production.

3. Discuss the use of hedging and the futures market with agricultural commodities.
 - a. Discuss the role of the futures market in assisting firms in the protection against price risk.
 - b. Explain how farmers and marketing firms utilize hedging and options strategies associated with risk management.
 - c. Differentiate among hedges, options, and forward contracts.
 - d. Calculate and explain the use of basis for a particular commodity.

4. Develop an understanding of the basics of meat and livestock marketing.
 - a. Discuss how the production and product characteristics of livestock and meat influence the marketing of these products.
 - b. Develop an understanding of the changing market patterns and distribution channels of the meat and livestock sector.
 - c. Explain the different methods of marketing livestock in use today in the state of Mississippi.
 - d. Explain the consumer's role in the meat and livestock industry and how the industry is responding to these demands.

5. Develop an understanding of the basics of field crops marketing.
 - a. Discuss how the production and product characteristics of field crops influence the marketing of these products.
 - b. Develop an understanding of the changing market patterns and distribution channels of field crops.
 - c. Explain the different methods of marketing field crops in use today in the state of Mississippi.
 - d. Understand how government price supports can influence the demand and prices of field crops.

AFNR Career Cluster Content Standards

- AS.06. Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
- FPP.04. Select and process food products for storage, distribution, and consumption.
- PS.03. Propagate, culture, and harvest plants.
- ACAD 01. Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01. Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- COM 02. Employ technical communications effectively to maintain good records and reporting procedures.
- PSCT 01. Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- ITS 01. Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SYS 01. Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
- ELR 01. Know and understand the statement: Importance of professional ethics and legal responsibilities.
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- ABS.01. Utilize economic principles to establish and manage and AFNR business environment.
- ABS.02. Utilize appropriate management planning principles in AFNR business enterprises.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
- ABS.04. Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets, and credit for an AFNR business.
- ABS.05. Assess accomplishment of goals and objectives by an AFNR business.
- ABS.06. Use industry-accepted marketing practices to accomplish AFNR business objectives.
- ABS.07. Create a production system plan.

Course Number and Name: AGT 1613 Agriculture Records

Description: An introduction to agricultural record keeping techniques including single entry accounting methods, field and enterprise records, credit purchases, and sinking funds. Note: ACC 1213 Principles of Accounting I may be substituted.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe the components of agriculture records.
 - a. Compare financial to production records.
 - b. Identify the different components of financial records.
 - c. Identify the types of production records.
 - d. Discuss the major uses of record types.
2. Describe capital accounts and their financial components.
 - a. Develop depreciation work sheets for the major types of depreciation.
 - b. Develop a depreciation schedule combining several different types of depreciation and depreciable items.
3. Describe the different types of credit.
 - a. Identify the different types of farm loans.
 - b. Calculate a loan amortization factor for the purchase of a major item of machinery.
 - c. Develop a repayment schedule for a major equipment purchase.
 - d. Develop records used to manage accounts payable for short-term credit accounts using a single entry format.
4. Develop components for production records.
 - a. Develop data collection components for land and/or enterprise records.
5. Distinguish between single entry accounting and double entry accounting systems.
 - a. Describe the cash accounting method.
 - b. Describe the accrual accounting method.

AFNR Career Cluster Content Standards

- ABS.01. Utilize economic principles to establish and manage and AFNR business environment.
- ABS.02. Utilize appropriate management planning principles in AFNR business enterprises.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
- ABS.04. Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets, and credit for an AFNR business.
- ABS.05. Assess accomplishment of goals and objectives by an AFNR business.
- ABS.06. Use industry-accepted marketing practices to accomplish AFNR business objectives.
- ABS.07. Create a production system plan.

Course Number and Name: AGT 1714 Applied Soils – Conservation and Use

Description: A course to introduce students to the general principles of soil conservation and safe use. It includes instruction in the soil formation process, properties of soils, soil texture, and soil management for optimum safe use. Note: AGR 2314 Basic Soils may be substituted for this course.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe the soil formation process.
 - a. Describe the chemical and biological properties of soils.
 - b. Discuss the different types of erosion.
 - c. Identify the horizons of a soil profile.
2. Describe the different physical properties of soils.
 - a. Define the term soil texture, and relate texture to productivity and management.
 - b. Classify soils as to general textural class.
 - c. Describe the effects of soil texture, structure, permeability, and compaction/tilth on soil productivity.
3. Develop soil management strategies for sustaining soil productivity.
 - a. Define and contrast the terms fertility and productivity as applied to a soil.
 - b. Describe the effects of tillage and traffic as related to soil structure and productivity.
 - c. Describe how soil pH affects plant growth and nutrient availability, and state methods that can be used to raise or lower pH.
4. Describe the properties of soil water.
 - a. Define the relationship between soil type and water holding capacity.
 - b. Discuss the need for water conservation.
 - c. Describe the mechanics of soil drainage (man-made and natural).
 - d. Compare the advantages and disadvantages of different types of irrigation systems.

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- SYS 01 Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
- SHE 01 Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- ELR 01 Know and understand the statement: Importance of professional ethics and legal responsibilities.

- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- ABS.02. Utilize appropriate management planning principles in AFNR business enterprises.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
- ABS.07. Create a production system plan.
- NRS.01. Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
- NRS.02. Apply scientific principles to natural resource management activities.
- NRS.03. Apply knowledge of natural resources industries to production and processing industries.
- NRS.04. Demonstrate techniques used to protect natural resources.
- NRS.05. Use effective methods and venues to communicate natural resource processes to the public.
- PS.02. Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.

Course Number and Name: AGT 1813 Fitting/Grooming/Judging

Description: Provides information and practice on fitting, grooming, and judging livestock products.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Practice the processes and procedures used in fitting and grooming livestock.
 - a. Make a rope halter.
 - b. Select an animal for show or sale.
 - c. Break the selected animal to lead at halter.
 - d. Clip the selected animal.
 - e. Wash the selected animal.
 - f. Groom the selected animal.
 - g. Prepare the selected animal for show or sale.
 - h. Show the selected animal.
2. Explain the importance of livestock production.
 - a. Identify the trends in livestock selection since World War II.
 - b. Describe the future trends in livestock selection within the next 10 years.
3. Explain the evaluation process of beef cattle.
 - a. Identify the parts of beef cattle.
 - b. Describe the general and specific terms utilized in judging breeding beef and market beef cattle.
 - c. Write and orally deliver reasons for placement of beef cattle, using proper terminology and organization of reasons.
 - d. Describe the importance of utilizing expected progeny difference (EPD) in beef cattle evaluation.
4. Explain the evaluation process of swine.
 - a. Identify the parts of swine.
 - b. Describe the general and specific terms utilized in judging breeding and market swine.
 - c. Write and orally deliver reasons for the placement of swine, using proper terminology and organization of reasons.
 - d. Describe the importance of utilizing performance data in swine evaluation.
5. Explain the evaluation process of sheep.
 - a. Identify the parts of sheep.
 - b. Describe the general and specific terms utilized in judging breeding and market sheep.
 - c. Write and orally deliver reasons for the placement of sheep, using proper terminology and organization of reasons.
 - d. Describe the importance of utilizing performance data in sheep evaluation.
6. Explain the evaluation process of horses.
 - a. Identify the parts of horses.
 - b. Describe the general and specific terms utilized in judging horses.
 - c. Write and orally deliver reasons for the placement of horses, using proper terminology and organization of reasons.

- d. Describe the importance of utilizing performance data in horse evaluation.

AFNR Career Cluster Content Standards

COM 02	Employ technical communications effectively to maintain good records and reporting procedures.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
AS.01.	Examine the components, historical development, global implications, and future trends of the animal systems industry.
AS.02.	Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.
AS.03.	Provide for proper health care for animals.
AS.04.	Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
AS.05.	Evaluate and select animals based on scientific principles of animal production.
AS.06.	Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
AS.07.	Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.
AS.08.	Analyze environmental factors associated with animal production.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
FPP.01.	Examine components of the food industry and historical development of food products and processing.
FPP.02.	Apply safety principles, recommended equipment, and facility management techniques to the food products and processing industry.
FPP.03.	Apply principles of science to the food products and processing industry.

Course Number and Name: **AGT 1913 Animal Reproduction**

Description: This course provides information and laboratory opportunities to assist students in learning about animal reproduction.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Differentiate between phenotype and genotype.
 - a. Explain how environment affects phenotype.
 - b. Describe the effect of genetics on phenotype.
 - c. Explain how genotype is derived.

2. Explain the male reproductive tract.
 - a. Draw and label the male reproductive tract.
 - b. Describe the function of the accessory sex glands.
 - c. Describe how malformation affects reproduction.

3. Explain the function of sperm.
 - a. Draw and label the parts of sperm.
 - b. Describe the types of sperm abnormalities.
 - c. Describe the tests normally performed on sperm.
 - d. Describe the properties of a good semen diluter.
 - e. Identify the causes of sperm death.
 - f. Explain how environment affects sperm quality.

4. Explain the female reproductive tract.
 - a. Draw and label the female reproductive tract.
 - b. Describe the functions of the ovary.
 - c. Describe the relationship of the pituitary gland and the ovary.
 - d. Identify the causes of reproductive failure.

5. Explain the estrus cycle.
 - a. Describe the methods of genetic manipulation.
 - b. Describe genetic sex determination.
 - c. Classify the types of sex abnormalities.

6. Perform reproductive management techniques.
 - a. Demonstrate the ability to pass a catheter through the cervix.
 - b. Perform pregnancy testing.
 - c. Cite methods of heat synchronization.
 - d. Discuss embryo transfer protocols and techniques.

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- AS.04. Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
- AS.05. Evaluate and select animals based on scientific principles of animal production.
- AS.06. Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
- AS.07. Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.
- AS.08. Analyze environmental factors associated with animal production.
- BS.03 Demonstrate the application of biotechnology to AFNR pathways.
- PS.01. Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
- PS.02. Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
- PS.03. Propagate, culture, and harvest plants.

Course Number and Name: **AGT 2154** **Geographic Information Systems I**

Description: This course is an overview of applications of Geographic Information Systems. Commercial software is used to cover user interface, views, themes, tables, and layouts. Basic functions of building, editing, querying, and spatial analysis of layers and databases will be reviewed. Hands-on exercises will encompass several disciplines and will include mobile GIS applications.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment: None

Pre-requisite: Instructor Approved

Student Learning Outcomes:

1. Define and describe the components of a Geographic Information System (GIS).
 - a. Describe the user interface of GIS.
 - b. Describe the mapping components of GIS.
 - c. Describe the database components of GIS.
 - d. Describe how the interface, mapping, and database are interrelated and used.

2. Practice the use of map views and data layers in a Geographic Information System.
 - a. Use map views to display a variety of data layers.
 - b. Add, open, or edit a map view.
 - c. Define properties of map view.
 - d. Add a theme to view.
 - e. Create or edit a theme (layer).
 - f. Define properties of a theme.

3. Use tables and databases in a Geographic Information System.
 - a. Manipulate and edit data in tables and databases.
 - b. Add, open, import, or create a table or database.
 - c. Add, delete, or edit a record or field to table or database.

4. Construct a layout using map features, tables, and database information.
 - a. Define a layout.
 - b. Add, delete, or edit map components.

5. Use the query function to retrieve information in a Geographic Information System.
 - a. Define a query.
 - b. Maintain query results in a table or database.
 - c. Present query results in a report or map view.

6. Use spatial analysis to address questions in a Geographic Information System.
 - a. Add, delete, or edit attributes of view components.
 - b. Link spatial data to create a model.

7. Describe the components of a mobile Geographic Information System.
 - a. Define the components and processes for linking the desktop GIS to the mobile GIS.
 8. Describe the use of mobile GIS for data accession.
 - a. Define the properties of the data layers.

- b. Define the data input, import, and export procedures.

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- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- ESS.01. Use analytical procedures to plan and evaluate environmental service systems.
- ESS.02. Assess the impact of policies and regulations on environmental service systems.
- ESS.06. Use tools, equipment, machinery, and technology to accomplish tasks in environmental service systems.
- PST.01. Use physical science principles and engineering applications with power, structural and technical systems to solve problems and improve performance.
- PST.02. Design, operate and maintain mechanical equipment, structures, biological systems, land treatment, power and technology.
- PST.05 Apply technology principles in the use of agricultural technical systems.

Course Number and Name: AGT 2164 Variable Rate Technology

Description: An introductory course on basic principles of variable rate technology (VRT) (site-specific, precision farming technology). This course will provide instruction on the importance of variable rate technology; data collection techniques for variable rate applications; development of prescription application maps and components; and calibration, installation, and troubleshooting of variable rate equipment.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe how variable rate technologies and precision farming techniques benefit agricultural producers and the general public.
 - a. Describe fundamental operating processes of VRT.
 - b. Identify economic factors related to VRT.
 - c. Describe environmental impact factors related to VRT.
 - d. Describe how UAS (Unmanned Aerial Systems) could impact VRT in the future.
2. Describe various components of VRT equipment and their relationship to other components (e.g., GNSS, GIS, controllers, planter, sprayer, nutrient applicator, etc.).
 - a. Describe applications of GNSS in VRT.
 - b. Describe the applications of GIS in VRT.
 - c. Describe the relationship of GNSS and GIS to other components of VRT.
3. Describe how various types of data can be used for VRT.
 - a. Discuss geo-referenced field scouting (e.g., soil sampling, plant population, percent vegetation, crop stage, weed infestations, soil moisture, insect populations, plant height, etc.).
 - b. Describe the use of sensor based data collectors [e.g., Veris (soil electrical conductivity) soil mapping system, yield monitor, profiler (geo-referenced penetrometer - soil compaction), geo-referenced weed sensor, etc.].
 - c. Identify remote imagery (e.g., aerial photography, multispectral, video, etc.).
 - d. Discuss the collection and use of historical data (e.g., knowledge of farmer).
4. Apply mathematical relationships to convert collected data into prescription application maps (e.g., field scouting data, geo-referenced sensor devices, scanned imagery, remote imagery, historical data, zone management versus pixel based, etc.).
 - a. Discuss data requirements and analysis techniques for prescription generation.
5. Apply principles of VRT equipment operation to include calibration, operation, and troubleshooting (e.g., GNSS, planter, sprayer, nutrient applicator, etc.).
 - a. Discuss principles of application equipment calibration.
 - b. Discuss the limitations of VRT equipment and procedures.
 - c. Describe how to make variable rate applications without using a GNSS and GIS.
 - d. Describe troubleshooting procedures for VRT equipment.

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- ESS.01. Use analytical procedures to plan and evaluate environmental service systems.
- ESS.02. Assess the impact of policies and regulations on environmental service systems.
- ESS.06. Use tools, equipment, machinery, and technology to accomplish tasks in environmental service systems.
- PST.01. Use physical science principles and engineering applications with power, structural and technical systems to solve problems and improve performance.
- PST.02. Design, operate and maintain mechanical equipment, structures, biological systems, land treatment, power and technology.
- PST.05 Apply technology principles in the use of agricultural technical systems.

Course Number and Name: AGT 2174 Agricultural Geographic Information Systems

Description: This course reviews several agricultural Geographic Information Systems, including the use of spatial data and spatial analysis for record keeping, modeling, and management of an agronomic ecosystem.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Apply GIS for record keeping and spatial analysis of data.
 - a. Construct a directory structure of farm data.
 - b. Create tables of spatial and temporal data for a farm's spatial management units.
 - c. Create relational links for spatial management unit tables.
 - d. Query, display, and analyze management unit data.
2. Apply spatial data analysis techniques.
 - a. Identify and process the data needed to make management decisions.
 - b. Create models relating various data layers associated with production management.
 - c. Create and implement maps to control variable rate technologies.
 - d. Analyze yield data.
3. Apply management and use of shape files.

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- ESS.06. Use tools, equipment, machinery, and technology to accomplish tasks in environmental service systems.

- PST.01. Use physical science principles and engineering applications with power, structural and technical systems to solve problems and improve performance.
- PST.02. Design, operate and maintain mechanical equipment, structures, biological systems, land treatment, power and technology.
- PST.05 Apply technology principles in the use of agricultural technical systems.

Course Number and Name: **AGT 2213 Agricultural Sales**

Description: A course in the advertising, sales, and promotion of agricultural supplies and services.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment: None

Pre-requisite: Instructor Approved

Student Learning Outcomes:

1. Analyze consumer needs and services.
 - a. Describe the concept of marketing as applied to the sales of agricultural supplies.
 - b. Analyze marketing strategies and systems.
 - c. Identify problems in market development.
 - d. Discuss the importance of developing a market share.

2. Describe techniques for selling.
 - a. Develop and deliver a sales presentation.
 - b. Develop an advertising scheme for an agricultural product.
 - c. Develop a plan for using follow-up as a sales tool.
 - d. Describe how credit is used as a sales tool.

3. Describe sales from the customer’s viewpoint.
 - a. Identify characteristics of a salesperson.
 - b. Describe the difference between customer needs and wants.
 - c. Prepare a survey for establishing a market for an agricultural product.

AFNR Career Cluster Content Standards

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- COM 02 Employ technical communications effectively to maintain good records and reporting procedures.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
- ABS.05. Assess accomplishment of goals and objectives by an AFNR business.

Course Number and Name: AGT 2263 Applied Agricultural Economics

Description: A course to introduce the student to economic principles as applied to agribusiness operations. Note: AGR 2713 Principles of Agricultural Economics, ECO 2113 Principles of Economics Macroeconomics, or ECO 2123 Principles of Economics Microeconomics may be substituted for this course.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe agribusiness relationship to the domestic and foreign economies.
 - a. Identify agribusiness structures.
 - b. Describe methods for organizing agribusiness.
 - c. Name the causes for seasonal output.
 - d. Show how graphs and charts are used to display and present economic facts and concepts.
2. Discuss demand theory and how a demand curve is developed.
 - a. Identify how the consumer relays information concerning wants and needs to the suppliers of goods and services.
 - b. Develop and label the demand curve.
 - c. Show the relationship between the slope of the demand curve and the concept of elasticity of demand.
 - d. Discuss factors that influence demand elasticities.
3. Discuss the economic facts associated with single variable inputs.
 - a. Identify the profit motive and how it affects the use of variable inputs in crop production.
 - b. Identify the derived demand for an input.
 - c. Describe and apply the concept of marginalism to use of variable inputs.
 - d. State the law of diminishing returns and the relationship to use of single variable inputs.
4. Define the relationship between cost and length of run when used in planning and decision making.
 - a. Discuss the term production function.
 - b. Identify the different cost concepts used to describe the production of agricultural products.
 - c. Describe the factors that affect farm size.
5. Analyze government influence on the production and price of farm commodities.
 - a. Define equilibrium price.
 - b. Analyze public policy in production system.
 - c. Discuss the influence of government regulations and foreign policy on stability and profitability of agricultural systems.
 - d. Identify the causes of surplus and shortage and the role government programs play.
 - e. Define the benefactor of all government subsidies and payments.
 - f. Identify relationships between government agencies and the cost of producing food and fiber.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- SYS 01 Understand roles within teams, work units, departments, organizations, interorganizational systems, and the larger environment.
- ELR 01 Know and understand the statement: Importance of professional ethics and legal responsibilities.
- ABS.01. Utilize economic principles to establish and manage and AFNR business environment.
- ABS.02. Utilize appropriate management planning principles in AFNR business enterprises.
- ABS.06. Use industry-accepted marketing practices to accomplish AFNR business objectives.
- ABS.07. Create a production system plan.
- AS.01. Examine the components, historical development, global implications, and future trends of the animal systems industry.
- FPP.04. Select and process food products for storage, distribution, and consumption.
- PS.03. Propagate, culture, and harvest plants.

Course Number and Name: AGT 2363 Crop Production General

Description: This course is a study of crop production techniques including tillage and planting, pest control, and physical marketing practices for crops in Mississippi.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe the utilization of field crops.
 - a. Describe the history and development of field crops.
 - b. Identify products that utilize grain products.
2. Describe processes involved in the production and marketing grain crops.
 - a. Discuss the different factors that determine the suitability of crops to product in your location.
 - b. List and describe the major field crops produced in Mississippi.
 - c. Discuss the different production systems for each major field crop produced in Mississippi.
 - d. List the different marketing strategies, and discuss the advantage and disadvantages of each.
 - e. Discuss the different climatic factors and their effect on crop production.
3. Classify the different types of disease and pest problems experienced in the production of field crops in Mississippi.
 - a. Identify prominent weeds and insects and their control.
 - b. Identify plant diseases and their control.
 - c. Explain integrated crop management.
 - d. Discuss the role of certified crop advisors.
4. Identify tillage and harvesting systems and production practices used for the production of grain crops in Mississippi.
 - a. Differentiate between conventional, conservation, and no-till tillage systems.
 - b. Compare the different tillage systems as to their profitability and sustainability in filed crop production.
 - c. Identify equipment necessary for seedbed preparation, cultivation, and harvesting of field crops.
5. Identify methods for maintaining soil productivity in Mississippi.
 - a. Define the role that soil types play in grain crop selection and production.
 - b. Determine proper fertility levels essential for field crop production.
 - c. Identify sources of nutrients for grain production.
 - d. Describe different irrigation systems and there feasibility.
 - e. Describe soil drainage and its impact on crop production.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.

PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
TECH 01	Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
ABS.01.	Utilize economic principles to establish and manage an AFNR business environment.
ABS.06.	Use industry-accepted marketing practices to accomplish AFNR business objectives.
ABS.07.	Create a production system plan.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
FPP.03.	Apply principles of science to the food products and processing industry.
NRS.01.	Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
NRS.02.	Apply scientific principles to natural resource management activities.
NRS.03.	Apply knowledge of natural resources industries to production and processing industries.
NRS.04.	Demonstrate techniques used to protect natural resources.
NRS.05.	Use effective methods and venues to communicate natural resource processes to the public.
PS.01.	Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
PS.02.	Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
PS.03.	Propagate, culture, and harvest plants.
PS.04.	Employ elements of design to enhance an environment.

Course Number and Name: AGT 2373 Fiber and Oilseed Crops

Description: This course is a study of crop production techniques including tillage and planting, pest control, and physical marketing practices for cotton, peanuts and soybeans.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Develop and determine knowledgeable skills concerning crop production.
 - a. Describe the history of cotton, peanuts and soybeans.
 - b. Describe the utilization of cotton, peanuts and soybeans.
2. Identify natural resource/crop relationships.
 - a. Define the role that soil types play in crop selection and production.
 - b. Examine the different types of water management practices.
 - c. Determine the fertility levels for alternative crop enterprises.
3. Classify the different types of environmental problems experienced in crop production in Mississippi.
 - a. Identify weeds and alternative control measures.
 - b. Identify insects and alternative control measures available.
 - c. Identify plant diseases and factors affecting diseases for crops grown in Mississippi.
 - d. Discuss government regulation concerning the use of production practices that alter or impact the environment.
4. Identify tillage systems and production practices used for crop production in Mississippi.
 - a. Discuss the characteristics of conventional tillage systems.
 - b. Discuss the characteristics of conservation tillage systems.
 - c. Discuss the characteristics of no-till tillage systems.
 - d. Compare tillage systems as to profitability and sustainability for production.
5. Apply the principles of plant mapping to production of cotton.
 - a. Describe plant mapping.
 - b. Explain how plant mapping can have an effect upon crop yields.
 - c. Collect data, and manipulate the variables on plant mapping in cotton.
6. Explain the inputs used in cotton, peanuts and soybean production.
 - a. Measure the heat index in reference to cotton, peanut and soybean production.
 - b. Observe cotton, peanut and soybean growth stages.
 - c. Apply principles of climatic environment to cotton, peanut and soybean growth.
 - d. Identify fertility needs for cotton, peanut and soybean production.
 - e. Identify irrigation requirements for cotton, peanut and soybean production.
7. Explain the principles of using chemical growth regulators and their use in controlling cotton growth.
 - a. Identify sources of plant growth regulation.
 - b. Apply plant growth regulators to growing crops.

AFNR Career Cluster Content Standards

ACAD 01	Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
COM 01	Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
TECH 01	Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
ABS.01.	Utilize economic principles to establish and manage an AFNR business environment.
ABS.06.	Use industry-accepted marketing practices to accomplish AFNR business objectives.
ABS.07.	Create a production system plan.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
FPP.03.	Apply principles of science to the food products and processing industry.
NRS.01.	Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
NRS.02.	Apply scientific principles to natural resource management activities.
NRS.03.	Apply knowledge of natural resources industries to production and processing industries.
NRS.04.	Demonstrate techniques used to protect natural resources.
NRS.05.	Use effective methods and venues to communicate natural resource processes to the public.
PS.01.	Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
PS.02.	Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
PS.03.	Propagate, culture, and harvest plants.
PS.04.	Employ elements of design to enhance an environment.

Course Number and Name: **AGT 2383 Grain Crops**

Description: This course is a study of grain production techniques including tillage, planting, pest control, and physical marketing practices for grain crops in Mississippi. (Crops included are corn or maize, rice, wheat, and milo.)

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe the utilization of grain crops.
 - a. Describe the history and development of grain crops.
 - b. Identify products that utilize grain products.
 - c. Describe processes involved in processing and marketing grain crops.
2. Identify resource/crop relationships.
 - a. Define the role that soil types play in grain crop selection and production.
 - b. Determine fertility levels for grain crops.
3. Classify the different types of environmental problems experienced in the production of grain crops in Mississippi.
 - a. Identify weeds and alternative control measures.
 - b. Identify insects and alternative control measures.
 - c. Identify plant diseases and alternative control measures.
4. Identify tillage systems and production practices used for the production of grain crops in Mississippi.
 - a. Identify conventional tillage systems.
 - b. Identify conservation tillage systems.
 - c. Identify no-till systems.
 - d. Compare alternative tillage systems as to their profitability and sustainability in grain production.
5. Identify methods for maintaining soil productivity in Mississippi.
 - a. Determine levels of macronutrients essential for grain production.
 - b. Determine levels of micronutrients essential for grain production.
 - c. Identify sources of supplementary nutrients for grain production.
6. Examine water management practices for grain production.
 - a. Describe irrigation practices.
 - b. Describe drainage factors.
7. Identify machinery needs for grain production.
 - a. Identify equipment necessary for seedbed preparation, cultivation, and harvesting of grain crops.
 - b. Contrast the equipment needs for conventional versus conservation production systems.
8. Identify environmental factors that affect grain production in Mississippi.
 - a. Describe how temperature, cloud cover, and humidity affect the growth of grain crops.
 - b. Describe how different levels of rainfall affect the growth of grain crops.

AFNR Career Cluster Content Standards

ACAD 01	Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
COM 01	Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
TECH 01	Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
ABS.01.	Utilize economic principles to establish and manage an AFNR business environment.
ABS.06.	Use industry-accepted marketing practices to accomplish AFNR business objectives.
ABS.07.	Create a production system plan.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
FPP.03.	Apply principles of science to the food products and processing industry.
NRS.01.	Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
NRS.02.	Apply scientific principles to natural resource management activities.
NRS.03.	Apply knowledge of natural resources industries to production and processing industries.
NRS.04.	Demonstrate techniques used to protect natural resources.
NRS.05.	Use effective methods and venues to communicate natural resource processes to the public.
PS.01.	Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
PS.02.	Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
PS.03.	Propagate, culture, and harvest plants.
PS.04.	Employ elements of design to enhance an environment.

Course Number and Name: AGT 2413 Weed Control

Description: A course to provide students with information and skills for controlling plant pests in agricultural crops. This course includes instruction in the use and application of chemicals for weed control.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Define and identify weeds.
 - a. Define terms associated with weeds.
 - b. Identify weeds according to the growing season.
2. Explain ways in which weeds harm agricultural crops.
 - a. Describe how weeds can reduce crop yields.
 - b. Describe how weeds can lower human efficiency.
3. Describe the different types, classes, and formulations of herbicides and how each affects crops and weeds.
 - a. Describe inorganic herbicides.
 - b. Describe organic herbicides.
 - c. Identify different ways that herbicides are formulated.
4. Explain precautions to be followed to avoid injury to people, animals, and crops when applying herbicides.
 - a. Determine Environmental Protection Agency regulations pertaining to pesticide application.
 - b. Determine ways in which pesticides enter the body.
 - c. Describe selectivity in herbicides.
 - d. Identify safety equipment associated with herbicide application.
5. Interpret information on an herbicide container label.
 - a. Determine signal words.
 - b. Determine formulations.
 - c. Determine crops labeled for an herbicide.
6. Determine how and when to apply herbicides.
 - a. Establish time periods in which herbicides should be applied for maximum effectiveness.
 - b. Determine equipment and methods used to apply herbicides.
7. Calculate drift, and determine amounts of herbicides to be applied.
 - a. Calculate drift.
 - b. Explain the reasoning behind applying herbicides in certain quantities to avoid weed resistance and crop damage.
8. Calibrate a herbicide applicator to deliver the prescribed amount of an herbicide to a given area.
 - a. Identify equipment needed for calibration.
 - b. Calculate the calibration from data supplied.
9. Discuss emerging trends and issues in weed control.

AFNR Career Cluster Content Standards

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- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SHE 01 Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- ELR 01 Know and understand the statement: Importance of professional ethics and legal responsibilities.
- CAR.01 Know and understand the importance of employability skills.
- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
- BS.01. Recognize the historical, social, cultural, and potential applications of biotechnology.
- BS.03 Demonstrate the application of biotechnology to AFNR pathways.
- NRS.01. Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
- NRS.02. Apply scientific principles to natural resource management activities.
- NRS.04. Demonstrate techniques used to protect natural resources.
- NRS.05. Use effective methods and venues to communicate natural resource processes to the public.
- PS.01. Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
- PS.02. Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
- PS.03. Propagate, culture, and harvest plants.

Course Number and Name: AGT 2434 Crop Management Zones

Description: The focus of this course will be on the identification and management of production zones within crop fields. This course will provide students a working knowledge of geo-spatial tools and remote imaging techniques to identify regions of distinction within a field and methods to develop management strategies to maximize economic gains for cropping systems. The course will introduce the use of various decision support tools available for crop management, including geographic information systems and crop models.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Discuss basic principles of soil mapping.
 - a. Describe soil types, characteristics, and classes including nutrients, water holding capacity, texture, and topography.
 - b. Describe crop suitability to soils.
 - c. Describe the extent of soil variances within fields.
2. Discuss factors that determine crop production capabilities.
 - a. Describe factors contributing to crop production.
 - b. Describe crop stressors and indications of crop stress.
 - c. Describe methodologies of crop sampling including nutrient analysis (petiole N), weed sampling, insect sampling, and yield mapping.
3. Discuss basic principles of remote imaging techniques as applied to crop management zones.
 - a. Describe types of remote sensing technologies including panchromatic, hyperspectral, multispectral, and infrared.
 - b. Describe sources and availability of imagery including commercial providers, expenses, and analysis.
4. Apply sampling strategies.
 - a. Describe how to translate the acquired knowledge of soil and crop variability into sampling strategy for ground-truthing of remote imagery.
 - b. Describe soil electrical conductivity and how it relates to sampling.
 - c. Describe various sampling methodologies.
 - d. Design suitable strategies for optimal identification of variability.
 - e. Compare the pros and cons of each strategy, such as regular grid, staggered grid, directed grid, and zone sampling.
5. Discuss analysis strategies.
 - a. Describe the importance of proper analysis strategy for type and frequency of sampling.
 - b. Describe the analysis of soil and plant samples.
6. Develop management strategies.
 - a. Understand the relationships among soil characteristics, crop production, and management zone theory in precision agriculture operations.
 - b. Incorporate information from the production system to develop management strategies.
 - c. Describe methods to query across layers using map algebra, yield, soil, pest and crop variability, and profit margin.

- d. Describe the use of models to develop management strategies such as MZA, Cotman, and CropGro.

AFNR Career Cluster Content Standards

PLT1	Apply principles of anatomy and physiology to produce and manage plants in both a domesticated and a natural environment.
PLT3	Apply fundamentals of production and harvesting to produce plants.
TET1	Use tools, equipment, machinery, and technology to work in areas related to AFNR.
TEC1	Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
TEC3	Explain geospatial technology to demonstrate its applications.
ENV1	Use analysis procedures to plan and evaluate environmental service impacts.
ENV3	Apply scientific principles to environmental services.
ENV5	Use tools, equipment, machinery, and technology to accomplish tasks in environmental services.
ABS4	Utilize technology to accomplish AFNR business objectives.

Course Number and Name: AGT 2463 Insects and Controls

Description: A course to provide instruction and training in techniques of control of insect pests. This includes instruction in the safe and proper use of chemical and other control methods.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify insects associated with field crops.
 - a. Describe early season insects.
 - b. Describe mid-season insects.
 - c. Describe late season insects.
2. Identify the basic anatomy of insects.
 - a. Describe the main body segments.
 - b. Describe structures that originate from the three main body segments.
3. Identify types of insect damage incurred in field crops.
 - a. Describe damage to leaves.
 - b. Describe damage to stems.
 - c. Describe damage to roots.
 - d. Describe damage to fruiting structures.
4. Explain the life cycle of various insects.
 - a. Describe complete metamorphosis.
 - b. Describe incomplete metamorphosis.
5. Identify different insecticide/pesticide categories.
 - a. Describe contact chemicals and how they work.
 - b. Describe residuals and how they work.
 - c. Describe systemics and how they work.
 - d. Describe transgenic crops and how they work.
6. Identify different classes and formulations of insecticides and how each affects insects.
7. Describe precautions to be followed to protect people, animals, and crops when applying insecticides.
 - a. Determine Environmental Protection Agency regulations pertaining to insecticide application.
 - b. Determine ways in which pesticides enter the body.
 - c. Identify safety equipment and supplies involved with insecticide application.
8. Interpret information on an insecticide container label.
 - a. Identify signal words.
 - b. Describe formulations of insecticides.
 - c. Identify crops labeled for a particular insecticide.
9. Explain the relationship between how and when to apply insecticides.
 - a. Determine when insecticides should be applied.

- b. Identify equipment and methods used in insecticide application.
10. Compare aerial versus ground applications.
 - a. Contrast advantages and disadvantages of aerial and ground applications.
 - b. Calibrate ground application equipment.
 11. Identify alternative methods of insect control.
 - a. Describe biological insect control.
 - b. Describe cultural insect control.
 12. Identify insect damage levels.
 - a. Evaluate economic thresholds.
 - b. Evaluate zero damage level.
 - c. Evaluate equilibrium status.

AFNR Career Cluster Content Standards

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|---------|---|
| ACAD 01 | Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR. |
| COM 01 | Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR. |
| PSCT 01 | Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams. |
| ITS 01 | Use information technology tools specific to AFNR to access, manage, integrate, and create information. |
| SHE 01 | Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. |
| ELR 01 | Know and understand the statement: Importance of professional ethics and legal responsibilities. |
| CAR.01 | Know and understand the importance of employability skills. |
| TECH 01 | Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers. |
| ABS.03. | Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations. |
| BS.01. | Recognize the historical, social, cultural, and potential applications of biotechnology. |
| BS.03 | Demonstrate the application of biotechnology to AFNR pathways. |
| NRS.01. | Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments. |
| NRS.02. | Apply scientific principles to natural resource management activities. |
| NRS.04. | Demonstrate techniques used to protect natural resources. |
| NRS.05. | Use effective methods and venues to communicate natural resource processes to the public. |
| PS.01. | Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants. |
| PS.02. | Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth. |
| PS.03. | Propagate, culture, and harvest plants. |

Course Number and Name: AGT 2474 Site Specific Pest Management

Description: This course provides instruction and training in conventional and site-specific techniques used in control of agricultural pests including insects, diseases, weeds, and nematodes. Students will use pest management techniques and tools including spatial information systems to evaluate impact of pest injury and costs associated with control. Students will learn how variable rate technologies are applied in the field for site specific pest management.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
4	3	2	75

National Assessment: None

Pre-requisite: Instructor Approved

Student Learning Outcomes:

1. Review the most common insects, diseases, and weeds associated with agricultural crops in the midsouth and the damage they cause.
 - a. Describe basic taxonomic methods for identification of agricultural pests.
 - b. Describe common pests found in agricultural production systems in the midsouth.
 - c. Describe pest damage to plants, economic injury levels, and thresholds.
2. Explain principles of integrated pest management.
 - a. Describe chemical control methods.
 - b. Describe biological control methods.
 - c. Describe cultural control methods.
 - d. Describe how these and other methods are used together for pest management.
3. Identify different classes and formulations of pesticides and how they affect target pests.
 - a. Describe different classes and formulations of pesticides.
 - b. Describe how different pesticides work.
 - c. Describe precautions needed to protect people when applying pesticides.
 - d. Describe and identify equipment and methods used in pesticide application.
4. Describe how Global Navigation Satellite Systems (GNSS), geographic information systems (GISs), and remote sensing interact to aid in the control of crop pests.
 - a. Describe how spatial information systems are used to locate and identify pest problems.
 - b. Describe how spatial information systems are used to evaluate pest damage levels.
 - c. Describe how GIS, GNSS, and remote sensing are integrated for problem solving in pest management.
 - d. Analyze and interpret geo-spatial data gathered for solving pest management problems.
 - e. Describe economic benefits derived from the spatial information systems technology.
5. Describe and demonstrate how variable rate technology is applied for pest management.
 - a. Describe how variable rate technology is used in site-specific pest management.
 - b. Describe the calibration and operation of variable rate application equipment.

AFNR Career Cluster Content Standards

ACAD 01	Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
COM 01	Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
ELR 01	Know and understand the statement: Importance of professional ethics and legal responsibilities.
CAR.01	Know and understand the importance of employability skills.
TECH 01	Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
ABS.03.	Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
BS.01.	Recognize the historical, social, cultural, and potential applications of biotechnology.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
NRS.01.	Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
NRS.02.	Apply scientific principles to natural resource management activities.
NRS.04.	Demonstrate techniques used to protect natural resources.
NRS.05.	Use effective methods and venues to communicate natural resource processes to the public.
PS.01.	Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
PS.02.	Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
PS.03.	Propagate, culture, and harvest plants.

Course Number and Name: **AGT 2483 Agricultural Pest Management**

Description: A course to provide students with information and skills for controlling pests. This includes instruction in the use and application of chemicals for control of weeds, insects, and diseases.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify common pests in row crops.
 - a. Define terms associated with weeds, insects, and crop diseases.
 - b. Identify common weeds, insects, and diseases of plants.
2. Discuss ways in which pests harm agricultural crops.
 - a. Describe how weeds, insects, and plant diseases can reduce crop yields.
 - b. Describe how weeds, insects, and plant diseases can lower human efficiency.
3. Describe the different types, classes, and formulations of pesticides and how each affects crops and pests.
 - a. Describe transgenic crops and how they resist pests.
 - b. Identify the characteristics of different pesticide formulations.
4. Analyze precautions to be followed to avoid injury to people, animals, crops, and the general environment when applying pesticides.
 - a. Identify Environmental Protection Agency regulations pertaining to pesticide application.
 - b. Determine ways in which pesticides can enter the human body.
 - c. Describe the concept of selectivity as related to pesticides.
 - d. Identify and describe the use of safety equipment used with pesticide application.
5. Interpret information on a pesticide label.
 - a. Interpret signal words.
 - b. Interpret formulations.
 - c. Identify crops labeled for a specific pesticide.
 - d. Interpret application instructions and procedures for a specific pesticide.
6. Determine how and when to apply pesticides.
 - a. Establish time periods for maximum effectiveness of an application.
 - b. Determine equipment and methods for applying a specific pesticide.
 - c. Compare aerial versus ground applications of pesticides.
 - d. Calibrate a ground applicator.
7. Identify alternative methods of pest control.
 - a. Describe biological pest control methods.
 - b. Describe cultural pest control methods.
8. Examine pest damage levels.
 - a. Evaluate economic thresholds for damage.
 - b. Evaluate the zero damage level.
 - c. Evaluate an equilibrium status.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SHE 01 Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- ELR 01 Know and understand the statement: Importance of professional ethics and legal responsibilities.
- CAR.01 Know and understand the importance of employability skills.
- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
- BS.01. Recognize the historical, social, cultural, and potential applications of biotechnology.
- BS.03 Demonstrate the application of biotechnology to AFNR pathways.
- NRS.01. Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
- NRS.02. Apply scientific principles to natural resource management activities.
- NRS.04. Demonstrate techniques used to protect natural resources.
- NRS.05. Use effective methods and venues to communicate natural resource processes to the public.
- PS.01. Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
- PS.02. Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
- PS.03. Propagate, culture, and harvest plants.

Course Number and Name: **AGT 2513 Management of Commercial Layers**

Description: This course is designed to give the student practical principles and application techniques in the management of commercial layers.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe hatching and transportation to the farm.
2. Describe the starting and growing of pullets.
3. Understand management of laying hens.
4. Discuss animal welfare of laying hens.
5. Understand the molting process.

Course Number and Name: **AGT 2523** **Introduction to Poultry Production**

Description: This course is designed to give the student practical principles and application techniques in the production, processing, and marketing of poultry and/or poultry products.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Understand the components of the poultry industry.
2. Describe the anatomy and structure of a fowl.
3. Describe the physiology and reproduction of poultry.
4. Describe the genetics and breeding of poultry.
5. Describe the incubation process in hatchery management.
6. Describe the social behavior of animal welfare in poultry.
7. Discuss environment and housing of poultry.
8. Describe diseases and parasites in poultry.
9. Describe poultry and egg marketing.
10. Describe broiler, egg and turkey production.
11. Discuss various miscellaneous poultry.
12. Discuss waste management systems.

Course Number and Name: **AGT 2533 Poultry Nutrition**

Description: This course is designed to give the student practical principles and application techniques in poultry nutrition.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Label the digestive tract of poultry.
2. Identify the functions of each component of the digestive tract in poultry.
3. Describe the digestive process (metabolism and feeding water).
4. Describe feed components of poultry (protein, carbohydrates, water, vitamins, minerals, energy, etc.).
5. Determine the nutrient requirements of broilers/laying hens.
6. Convert nutritional units of measurement.
7. Understand ration formulation and least cost analysis.

Course Number and Name: **AGT 2543 Hatchery/Feed Mill Management**

Description: This course is designed to give the student practical principles and application techniques in hatchery/feed mill management.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Understand the storage and selection of hatching eggs.
2. Discuss modern incubators.
3. Describe the factors affecting hatchability.
4. Understand of the National Poultry Improvement Plan.
5. Understand Hatchery Sanitation.
6. Describe the different feedstuffs for poultry diets.
7. Describe the design of a feed mill.
8. Understand feed formulations, ingredients and additives.
9. Understand poultry feed manufacturing.
10. Describe feed storage and transportation.

Course Number and Name: **AGT 2553 Broiler Production**

Description: This course is designed to give the student practical principles and application techniques in broiler production.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Discuss broiler breeders.
2. Describe housing for broilers.
3. Understand chick quality.
4. Describe types of brooding methods.
5. Describe brooding, water, feeding and other equipment.
6. Discuss feed, water and lighting programs.
7. Discuss ventilation in broiler production.
8. Understand catching and hauling of broilers.
9. Understand grower and company responsibilities.

Course Number and Name: **AGT 2563** **Agricultural Machinery and Shop Management**

Description: A comprehensive course studying operation and management of farm power machinery and shop repairs and maintenance. Note: Farm Machinery (AGR 1413) may be taken in lieu of this course.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify safety procedures with all tools and equipment.
 - a. Pass a general shop safety test.
 - b. Pass a tractor and farm equipment safety test.
 - c. Pass a tool identification test.

2. Measure machine capacity.
 - a. Determine capacity measuring methods.
 - b. Select the optimum machine operating speed.

3. Determine how to improve field efficiency of machines.
 - a. Calculate machine performance rate.
 - b. Assess the value of preventive maintenance.
 - c. Assess the impact of technological obsolescence.

4. Calculate the economic alternatives of acquiring farm machinery.
 - a. Select tractors and equipment based on farm size.
 - b. Understand how to allow for expansion.

5. Demonstrate the skills needed to perform structural repair to farm machinery.
 - a. Demonstrate the proper procedures for use of a cutting torch.
 - b. Demonstrate the ability to perform basic gas welding.
 - c. Demonstrate the ability to perform basic arc welding.

6. Demonstrate the ability to perform minor mechanical maintenance on farm machinery.
 - a. Perform ordinary maintenance and service of machinery.
 - b. Demonstrate the ability to perform troubleshooting for power equipment using technical manuals, parts manuals, and service guides.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.

- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SHE 01 Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- ELR 01 Know and understand the statement: Importance of professional ethics and legal responsibilities.
- CAR.01 Know and understand the importance of employability skills.
- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- PST.02. Design, operate and maintain mechanical equipment, structures, biological systems, land treatment, power and technology.
- PST.03. Service and repair mechanical equipment and power systems.
- PST.05 Apply technology principles in the use of agricultural technical systems.

Course Number and Name: AGT 2573 Broiler Processing

Description: This course is designed to give the student practical principles and application techniques in broiler processing.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Understand plant layout and operation.
2. Discuss food safety/microbiology.
3. Understand sanitation/maintenance.
4. Describe live poultry/yield.
5. Describe evisceration.
6. Understand moisture and chilling.
7. Describe USDA inspection/grading.
8. Describe second processing and shipping.
9. Describe sales and waste water.

Course Number and Name: **AGT 2583 Poultry Production & Processing Internship**

Description: This course is designed to give the student practical principles and application techniques in poultry production and processing.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	3	0	45

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Prepare a training agreement.
 - a. Compile a written training agreement in cooperation with the instructor and employer that details work schedule and specific tasks/skills to be mastered in the program.
2. Prepare and submit written reports of the supervised experience.
 - a. Submit weekly reports to the instructor summarizing activities and tasks completed.
 - b. Submit a final report of activities and experiences.
3. Follow written guidelines for work experience programs.
 - a. Complete all required activities in the training agreement.
 - b. Adhere to all written and oral instructions for the supervised experience.

Course Number and Name: **AGT 2613 Forage and Pasture Crops**

Description: This course is designed to give the student a comprehensive course in the production and management of forage and pasture crops.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Describe the uses of forages.
 - a. Explain how forages are used for watershed management.
 - b. Identify the role of forages to livestock in the national economy.
 - c. Define grassland agriculture.
 - d. Identify problems faced by world population in relation to forages.

2. Compare the composition and nutritive value of forages.
 - a. Name the stages of growth for grasses and legumes and their relationships to nutritive value.
 - b. Describe the formation of nodules by legumes.
 - c. Compare hay to silage as an animal feed.

3. Examine the effects that farm management practices have on forage.
 - a. Examine the effects of grazing pressure on new plant seedlings.
 - b. Describe the relationship among plants, animals, and soils.
 - c. Describe harvest and storage methods of forage crops.
 - d. Determine the best practices for producing, harvesting, and storing high-quality hay.

4. Identify common forages found in the South.
 - a. Describe the management practices and nutritive values for each of the warm season annuals and perennials.
 - b. Describe the management practices and nutritive values for each of the cool season annuals and perennials.
 - c. Explain growth stages of legumes.
 - d. Design a mixed grass and legume system for pastures.
 - e. Calculate fertilizer requirements of grasses and legumes on existing soil test.

5. Identify weed control methods utilized in forage and pasture crops.
 - a. Describe broadleaf weed control methods.
 - b. Describe competitive grass control methods.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.

- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SHE 01 Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- TECH 01 Use the technical knowledge and skills required to pursue the full range of careers for all AFNR pathways, including knowledge of design, operation, and maintenance of technological systems critical to AFNR careers.
- ABS.01. Utilize economic principles to establish and manage and AFNR business environment.
- ABS.06. Use industry-accepted marketing practices to accomplish AFNR business objectives.
- ABS.07. Create a production system plan.
- AS.01. Examine the components, historical development, global implications, and future trends of the animal systems industry.
- AS.04. Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
- AS.08. Analyze environmental factors associated with animal production.
- BS.03 Demonstrate the application of biotechnology to AFNR pathways.
- FPP.03. Apply principles of science to the food products and processing industry.
- NRS.01. Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.
- NRS.02. Apply scientific principles to natural resource management activities.
- NRS.03. Apply knowledge of natural resources industries to production and processing industries.
- NRS.04. Demonstrate techniques used to protect natural resources.
- NRS.05. Use effective methods and venues to communicate natural resource processes to the public.
- PS.01. Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
- PS.02. Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
- PS.03. Propagate, culture, and harvest plants.
- PS.04. Employ elements of design to enhance an environment.

Course Number and Name: AGT 2663 Applied Animal Nutrition

Description: This course is designed to introduce the students a comprehensive course of study on the practical principles and applications of nutrition.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Identify the classes of nutrients including protein, fat, carbohydrates, vitamins, minerals, and water.
 - a. Describe the sources and major functions of water on the animal.
 - b. Describe the general structure, functions, and classification of carbohydrates.
 - c. Cite the general classification and functions of fat.
 - d. Explain the amino acid makeup of protein, and contrast essential and nonessential amino acids.
 - e. Identify and contrast macro minerals and micro minerals.
 - f. Identify and contrast water soluble and fat soluble vitamins.
2. Identify and contrast the differences in the digestive systems of the different species of farm animals.
 - a. Identify, in order of passage, the digestive organs of a monogastric animal.
 - b. Contrast the difference between the monogastric and ruminant stomach.
 - c. Explain the concept of horses utilizing forage.
 - d. Describe the digestion and absorption process in monogastric and ruminant animals.
3. Explain the process by which feedstuffs are analyzed.
 - a. Describe the processes to calculate the nutritive ratio and apparent digestibility.
 - b. Construct the energy scheme.
 - c. Compare the advantages and disadvantages of the proximate analysis, bomb calorimeter, and Van Soest Fiber Determination.
 - d. Compare the advantages and disadvantages of feeding trials, digestion trials, and balance trials.
4. Formulate rations for all classes of farm animals.
 - a. Formulate a ration for CP or energy using the Pearson Square.
 - b. Formulate a ration using the Double Pearson Square.
 - c. Formulate a least-cost ration using a computer.
5. Identify the various sources of feedstuffs for livestock.
 - a. Identify and distinguish between different categories of feedstuffs used as sources of roughage, protein, and energy.
 - b. Describe the uses of mineral and vitamin additives in livestock rations.
 - c. Describe the use of nonnutritive additives in feedstuffs.

AFNR Career Cluster Content Standards

- ACAD 01 Achieve specific academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within AFNR.
- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.

- SHE 01 Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- ELR 01 Know and understand the statement: Importance of professional ethics and legal responsibilities.
- ABS.01. Utilize economic principles to establish and manage and AFNR business environment.
- ABS.02. Utilize appropriate management planning principles in AFNR business enterprises.
- AS.02. Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.
- AS.03. Provide for proper health care for animals.
- AS.04. Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
- AS.05. Evaluate and select animals based on scientific principles of animal production.
- AS.06. Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
- AS.07. Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.
- AS.08. Analyze environmental factors associated with animal production.
- ESS.03. Apply scientific principles to environmental service systems.
- NRS.01. Explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments

Course Number and Name: AGT 2713 Beef Production I

Description: This course will provide knowledge and practice in the area of beef production. The course includes instruction in animal breeding and nutrition and livestock handling practices.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Classify the common breeds by ease of management.
 - a. Describe size of beef cattle breeds in relationship to ease of management.
 - b. Describe climate in relation to different beef cattle breeds.
2. Describe the genetics and breeding of beef cattle.
 - a. Name the principles of animal breeding.
 - b. Describe the systems of beef cattle breeding.
 - c. Identify the fundamentals of heredity in beef cattle.
 - d. Define selection response in relation to genetics and environment.
 - e. Compare the benefits of purebreeding versus crossbreeding.
3. Explain the importance of sire selection and cow selection.
 - a. Name the criteria for selecting artificial insemination (AI) sires.
 - b. Specify criteria for selecting replacement heifers.
 - c. Compile a list of factors to consider in selecting the productive female.
 - d. Describe the circumstances normally used in culling cows.
4. Compare fall calving versus spring calving.
 - a. Describe the different market avenues for spring and fall calves.
 - b. Compare the costs of producing fall and spring calves.
 - c. Compare requirements for cows producing fall and spring calves.
5. Examine factors that influence herd size.
 - a. Describe land requirements.
 - b. Describe investments in animals.
6. Demonstrate beef cattle management skills.
 - a. Perform dehorning of cattle.
 - b. Perform castration of cattle.
 - c. Perform ear tagging of cattle.
 - d. Perform hoof trimming of cattle.
 - e. Perform tattooing of cattle.
 - f. Perform branding of cattle.
 - g. Perform weighing of cattle.
 - h. Perform worming of cattle.
7. Explain beef cattle nutrition.
 - a. Identify the major feeds for beef cattle.
 - b. Describe nutrient requirements as related to the season.
 - c. Develop a preconditioning program for calves.

AFNR Career Cluster Content Standards

COM 01	Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
COM 02	Employ technical communications effectively to maintain good records and reporting procedures.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
ABS.01.	Utilize economic principles to establish and manage an AFNR business environment.
ABS.02.	Utilize appropriate management planning principles in AFNR business enterprises.
ABS.03.	Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
ABS.04.	Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets, and credit for an AFNR business.
ABS.05.	Assess accomplishment of goals and objectives by an AFNR business.
ABS.06.	Use industry-accepted marketing practices to accomplish AFNR business objectives.
ABS.07.	Create a production system plan.
AS.01.	Examine the components, historical development, global implications, and future trends of the animal systems industry.
AS.02.	Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.
AS.03.	Provide for proper health care for animals.
AS.04.	Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
AS.05.	Evaluate and select animals based on scientific principles of animal production.
AS.06.	Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
AS.07.	Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.
AS.08.	Analyze environmental factors associated with animal production.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
FPP.01.	Examine components of the food industry and historical development of food products and processing.
FPP.02.	Apply safety principles, recommended equipment, and facility management techniques to the food products and processing industry.
FPP.03.	Apply principles of science to the food products and processing industry.
PS.01.	Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
PS.02.	Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
PS.03.	Propagate, culture, and harvest plants.

Course Number and Name: AGT 2723 Beef Production II

Description: This course covers a continuation of Beef Production I with emphasis on management, herd health, and marketing.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment: None

Pre-requisite: Instructor Approved

Student Learning Outcomes:

1. Explain how the cost of beef production can be reduced by improving efficiency.
 - a. Demonstrate a method of adjusting weaning weights.
 - b. Demonstrate how crossbreeding improves efficiency.
 - c. Describe how pasture improvement reduces production costs.
2. Manage beef cattle health.
 - a. Identify the major diseases that affect beef cattle.
 - b. Cite causes, prevention, and treatment of diseases in cattle.
 - c. Describe symptoms of specific diseases in beef cattle.
 - d. Design a program of beef cattle health, disease prevention, and parasite control.
3. Discuss beef cattle production.
 - a. Identify reproductive failures associated with nutrition.
 - b. Describe the effect of fever on reproduction.
 - c. Explain the use of hormones to improve reproduction.
4. Describe facilities required for beef cattle.
 - a. Explain the use of natural weather breaks.
 - b. Design a cattle handling and working facility.
 - c. Design a feed storage facility.
5. Explain methods for marketing cattle.
 - a. Compare cattle as to USDA grading system.
 - b. Compare direct packer sales to auction sales.
 - c. Describe the use of satellite marketing.
 - d. Discuss how management practices can be adjusted to fit a particular market.
6. Design a feed lot.
 - a. Discuss location of feed mill to pens.
 - b. Describe the rations used for feed lot cattle.
 - c. Contrast breeds as to feed lot efficiency.
 - d. Explain the types of feeding contracts.

AFNR Career Cluster Content Standards

- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.

COM 02	Employ technical communications effectively to maintain good records and reporting procedures.
PSCT 01	Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
ITS 01	Use information technology tools specific to AFNR to access, manage, integrate, and create information.
SHE 01	Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
ABS.01.	Utilize economic principles to establish and manage an AFNR business environment.
ABS.02.	Utilize appropriate management planning principles in AFNR business enterprises.
ABS.03.	Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
ABS.04.	Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets, and credit for an AFNR business.
ABS.05.	Assess accomplishment of goals and objectives by an AFNR business.
ABS.06.	Use industry-accepted marketing practices to accomplish AFNR business objectives.
ABS.07.	Create a production system plan.
AS.01.	Examine the components, historical development, global implications, and future trends of the animal systems industry.
AS.02.	Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.
AS.03.	Provide for proper health care for animals.
AS.04.	Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
AS.05.	Evaluate and select animals based on scientific principles of animal production.
AS.06.	Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
AS.07.	Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.
AS.08.	Analyze environmental factors associated with animal production.
BS.03	Demonstrate the application of biotechnology to AFNR pathways.
FPP.01.	Examine components of the food industry and historical development of food products and processing.
FPP.02.	Apply safety principles, recommended equipment, and facility management techniques to the food products and processing industry.
FPP.03.	Apply principles of science to the food products and processing industry.
PS.01.	Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
PS.02.	Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
PS.03.	Propagate, culture, and harvest plants.

Course Number and Name: AGT 2813 Swine Production

Description: This course is designed to give a comprehensive overview in the production and management of swine.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Compare swine production to other agriculture production systems.
 - a. Identify the factors favorable and unfavorable to swine production.
 - b. Formulate factors to consider in establishing a herd.
 - c. Compare different types of buildings, quarters, and waste disposal systems.
2. Choose methods of selection for herd improvement.
 - a. Compare genetic principles as related to heredity.
 - b. Describe different systems of breeding.
3. Discuss swine nutrition.
 - a. Specify how pastures, roughages, and silages can be used in a swine feeding program.
 - b. Specify the nutrient requirements for swine in different stages of production.
4. Cite causes of prevention and cure of diseases in swine.
 - a. Describe methods used in vaccinating swine.
 - b. Name diseases common in swine.
 - c. Define factors that affect the way the body copes with pathogens.
 - d. Differentiate between the way viruses and bacteria work in causing diseases.
 - e. Compare types of immunity.
 - f. Classify the basic types of immunizing agents.
 - g. Describe how nutrition, parasitism, heredity, and people contribute to diseases in animals.
5. Discuss the major breeds of swine in the U.S.
 - a. Identify the color patterns and ear shapes of different breeds of swine.
 - b. Identify difference in size, growth rate, muscle, backfat, and libido in the different breeds of swine.
6. Explain swine reproduction.
 - a. Identify the major organs in the reproductive tract of the boar and sow.
 - b. Discuss the reproductive cycle of a sow.
 - c. Discuss the reproductive life of the boar and sow.
 - d. Discuss the significance of artificial insemination in swine.

AFNR Career Cluster Content Standards

- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- COM 02 Employ technical communications effectively to maintain good records and reporting procedures.

- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
- ITS 01 Use information technology tools specific to AFNR to access, manage, integrate, and create information.
- SHE 01 Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- ABS.01. Utilize economic principles to establish and manage and AFNR business environment.
- ABS.02. Utilize appropriate management planning principles in AFNR business enterprises.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
- ABS.04. Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets, and credit for an AFNR business.
- ABS.05. Assess accomplishment of goals and objectives by an AFNR business.
- ABS.06. Use industry-accepted marketing practices to accomplish AFNR business objectives.
- ABS.07. Create a production system plan.
- AS.01. Examine the components, historical development, global implications, and future trends of the animal systems industry.
- AS.02. Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.
- AS.03. Provide for proper health care for animals.
- AS.04. Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
- AS.05. Evaluate and select animals based on scientific principles of animal production.
- AS.06. Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
- AS.07. Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.
- AS.08. Analyze environmental factors associated with animal production.
- BS.03 Demonstrate the application of biotechnology to AFNR pathways.
- FPP.01. Examine components of the food industry and historical development of food products and processing.
- FPP.02. Apply safety principles, recommended equipment, and facility management techniques to the food products and processing industry.
- FPP.03. Apply principles of science to the food products and processing industry.

Course Number and Name: AGT 2823 Fish Management

Description: This course is designed to give the student practical principles and application techniques in the production, harvesting, and marketing of fish.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Analyze the trends of commercial fish farming.
 - a. Interpret supply and demand for commercial fish products.
 - b. Determine species preference and product to be produced.
2. Determine pond requirements.
 - a. Calculate size of ponds.
 - b. Determine site selection of ponds.
 - c. Estimate construction costs of a specific size pond.
 - d. Determine type of drainage needed for ponds.
 - e. Determine availability of water.
 - f. Identify types of water pumps and their application.
3. Determine stocking rates.
 - a. Determine water volume.
 - b. Calculate stocking rate based upon age of fish and volume of water.
4. Analyze feeding plan.
 - a. Determine feeding requirements.
 - b. Determine feed conversion ratio and least cost of feeding.
5. Determine water quality.
 - a. Sample water and analyze water quality.
 - b. Determine time and methods to take oxygen measurements.
 - c. Prescribe corrective steps to be taken to improve water quality.
 - d. Maintain water quality.
6. Manage fish health.
 - a. Perform field dissection to determine the health of the fish.
 - b. Identify and treat fish diseases.
 - c. Identify and treat fish parasites.
7. Control fish predation.
 - a. Identify bird predation and controls.
 - b. Identify animal predation and controls.
8. Determine factors involved in harvesting and marketing fish.
 - a. Establish a market.
 - b. Determine time to harvest according to size and market demand.
 - c. Determine handling, seining, and hauling requirements.

9. Describe other systems of aquaculture than catfish production.
 - a. Describe tank culture systems.
 - b. Describe production of alternate species.

10. Describe controls for off-flavor.
 - a. Sample fish for off-flavor.
 - b. Identify causes of off-flavor.
 - c. Recommend prevention and treatment of off-flavor.

AFNR Career Cluster Content Standards

- | | |
|---------|--|
| COM 01 | Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR. |
| COM 02 | Employ technical communications effectively to maintain good records and reporting procedures. |
| PSCT 01 | Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams. |
| ITS 01 | Use information technology tools specific to AFNR to access, manage, integrate, and create information. |
| SHE 01 | Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. |
| ABS.01. | Utilize economic principles to establish and manage an AFNR business environment. |
| ABS.02. | Utilize appropriate management planning principles in AFNR business enterprises. |
| ABS.03. | Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations. |
| ABS.04. | Apply generally accepted accounting principles and skills to manage cash budgets, credit budgets, and credit for an AFNR business. |
| ABS.05. | Assess accomplishment of goals and objectives by an AFNR business. |
| ABS.06. | Use industry-accepted marketing practices to accomplish AFNR business objectives. |
| ABS.07. | Create a production system plan. |
| AS.01. | Examine the components, historical development, global implications, and future trends of the animal systems industry. |
| AS.02. | Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics. |
| AS.03. | Provide for proper health care for animals. |
| AS.04. | Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals. |
| AS.05. | Evaluate and select animals based on scientific principles of animal production. |
| AS.06. | Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products. |
| AS.07. | Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals. |
| AS.08. | Analyze environmental factors associated with animal production. |
| BS.03 | Demonstrate the application of biotechnology to AFNR pathways. |
| FPP.01. | Examine components of the food industry and historical development of food products and processing. |
| FPP.02. | Apply safety principles, recommended equipment, and facility management techniques to the food products and processing industry. |
| FPP.03. | Apply principles of science to the food products and processing industry. |

Course Number and Name: AGT 2863 Horse Production

Description: This is a comprehensive course in the production and management of horses.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
3	2	2	60

National Assessment:

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Explain the history and development of the horse industry.
 - a. Describe the role of the horse in the development of the nation.
 - b. Describe the decline of the horse.
 - c. Determine uses of the horse today.
2. Assess the functional anatomy of the horse.
 - a. Describe the skeletal system in relationship to unsoundness.
 - b. Determine age in horses by teeth.
 - c. Draw and describe head markings.
 - d. Describe the different gaits of the horse.
3. Examine the difference in types of horse breeding programs.
 - a. Compare linebreeding and closebreeding as types of inbreeding.
 - b. Describe how different breeds are bred for particular functions.
 - c. Compare the characteristics of different breeds.
 - d. Determine the facilities needed for a breeding station.
 - e. Compare management and heredity as to development.
4. Develop a horse nutrition program.
 - a. Compare differences between horse feeds and cattle feeds.
 - b. Evaluate different hays according to suitability for horses.
5. Develop a horse health program.
 - a. Identify routine vaccinations.
 - b. Describe causes, prevention, and treatment of diseases.
 - c. Prepare a parasite control program.
 - d. Collect feces samples, and examine for parasites.
 - e. Describe how nutrition, parasitism, heredity, and people contribute to diseases of horses.
 - f. Identify factors that affect the way the body copes with disease.
6. Examine market avenues for horses.
 - a. Compare production sales with auction sales.
 - b. Describe factors that cause horses to increase/decrease in value.
 - c. Describe the role of the meat industry in relation to the horse..

AFNR Career Cluster Content Standards

- COM 01 Use oral and written communication skills in creating, expressing, and interpreting information and ideas including technical terminology and information within AFNR.
- COM 02 Employ technical communications effectively to maintain good records and reporting procedures.
- PSCT 01 Solve problems using critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams.
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- ABS.02. Utilize appropriate management planning principles in AFNR business enterprises.
- ABS.03. Utilize record keeping to accomplish AFNR business objectives while complying with laws and regulations.
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- ABS.05. Assess accomplishment of goals and objectives by an AFNR business.
- ABS.06. Use industry-accepted marketing practices to accomplish AFNR business objectives.
- ABS.07. Create a production system plan.
- AS.01. Examine the components, historical development, global implications, and future trends of the animal systems industry.
- AS.02. Classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.
- AS.03. Provide for proper health care for animals.
- AS.04. Apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.
- AS.05. Evaluate and select animals based on scientific principles of animal production.
- AS.06. Prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.
- AS.07. Select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.
- AS.08. Analyze environmental factors associated with animal production.
- BS.03. Demonstrate the application of biotechnology to AFNR pathways.
- PS.01. Apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.
- PS.02. Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth.
- PS.03. Propagate, culture, and harvest plants.

Course Number and Name: AGT 291(1-3) **Special Problem in Agricultural Business and Management Technology**

Description: This course is designed to provide students with an opportunity to utilize skills and knowledge gained in other Agricultural Business and Management courses. The instructor and student work closely together to select a topic and establish criteria for completion of the project.

Hour Breakdown:

Semester Hours	Lecture	Lab	Contact Hours
1		2	30
2		4	60
3		6	90

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Prepare a written plan.
 - a. Compile a written plan in cooperation with the instructor and student that details the schedule and specific tasks/skills to be mastered in the program.
2. Prepare a written report of activities.
 - a. Compile a daily log of activities and tasks.
 - b. Submit weekly reports to the instructor summarizing activities and tasks completed.
 - c. Submit a final report of activities and experiences.
3. Follow written guidelines for special problems courses.
 - a. Complete all required activities in the plan.
 - b. Adhere to all written and oral instructions for the special problem.

Course Number and Name: AGT 292(1-6) **Supervised Agricultural Experience**

Description: This internship course provides actual work experience in an agriculture business under the direction of the employer and the instructor.

Hour Breakdown:

Semester Hours	Lecture	Externship	Contact Hours
1		3	45
2		6	90
3		9	135
4		12	180
5		15	225
6		18	270

National Assessment: None

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Prepare a training agreement.
 - a. Compile a written training agreement in cooperation with the instructor and employer that details work schedule and specific tasks/skills to be mastered in the program.
2. Prepare and submit written reports of the supervised experience.
 - a. Submit weekly reports to the instructor summarizing activities and tasks completed.
 - b. Submit a final report of activities and experiences.
3. Follow written guidelines for work experience programs.
 - a. Complete all required activities in the training agreement.
 - b. Adhere to all written and oral instructions for the supervised experience.

RECOMMENDED TOOLS AND EQUIPMENT

Capitalized

1. Computer with Internet access (16)
2. Computer, notebook (1)
3. Microscope, dissecting with lights (8)
4. Microscope, with lights (8)
5. Oven, soil drying
6. Plant mobil (1)
7. Printer, color inkjet with cables and switches (8)
8. Remote weather station (Temperature, barometric pressure, and rainfall) (1)
9. Table, soils lab (2)
10. Tank, artificial insemination (1)
11. Transit level with Philadelphia rods (3)
12. Greenhouse (1)

Non-Capitalized

1. pH tester (2)
2. Root view chamber (1)
3. Seed germination oven (1)
4. Soil compaction tester (1)
5. Soil moisture tester (Tensiometer) (1)
6. Soil sample probe (4)
7. Table, printer (8)
8. Workstation, computer with hatches (16)

Additional Tools and Equipment for Animal Science Technology Concentration

CAPITALIZED ITEMS

1. Chute, blocking (1)
2. Chute, cattle squeeze (1)*
3. Disk harrow (1)*
4. Electro-ejaculator (1)
5. Feed grinder/mixer (1)*
6. Grain drill (1)
7. Drag harrow (1)*
8. Hay roller (1)*
9. Hay rake (1)*
10. Hay cutter, disc (1)*
11. Pasture clipper (1)*
12. Scales, livestock (1)*
13. Sprayer, pasture with tank (1)
14. Stock trailer (1)*
15. Tractor (1)*
16. Truck, 3/4 - 1 ton (1)*
17. Artificial insemination kit/supplies (1)
18. Artificial insemination breeding simulator (1)
19. Hay Transport Trailer (1)
20. Utility Vehicle (with trailer) (1)

* Used equipment is acceptable provided it is available and in satisfactory condition.

NON-CAPITALIZED ITEMS

1. Blow dryer (1)
2. Clippers, large animal (1)
3. Electric fence charger (1)

Additional Tools and Equipment for Field Crops Concentration

CAPITALIZED ITEMS

1. Air compressor (1)*
2. Applicator, herbicide (rope wick) (1)
3. Arbor press (1)*
4. Arc welder (2)
5. Band saw, metal cutting (1)*
6. Bin, grain storage (Small scale with loading and unloading capacity) (2)
7. Blade, box (1)*
8. Blade, grader (1)*
9. Chisel plow (1)*
10. Chop saw (1)*
11. Combine with grain and corn headers (1)*
12. Cotton picker (1)*
13. Cultivator, row crop (1)*
14. Cultivator, field (1)*
15. Dirt bucket (1)*
16. Disk harrow (1)*
17. Ditcher, water furrow (1)*
18. Drill press (1)*
19. Eye wash and shower, portable (1)
20. Fertilizer applicator, dry (1)
21. Grain drill (modern) (1)
22. Grinder, bench (1)*
23. Grinder, surface (1)*
24. Harrow, tumbling (1)*
25. Hipper (1)*
26. Land plane (1)*
27. Laser system (For leveling land on grade) (1)*
28. Marker, row (1 set)*
29. Parts washer (1)*
30. Pesticide storage unit, portable (1)
31. Planter (modern row crop no-till, variable rate) (1)*
32. Plow, rice levee (1)*
33. Rotary cutter (1)*
34. Rotary hoe (1)*
35. Separator/tester, grain foreign material, portable (1)
36. Shop ventilation system (1)
37. Soil roller/packer (1)*
38. Spray boom, overhead with pump and tanks (1)
39. Sub-soiler, parabolic (1)*
40. Tractor (120 hp minimum) (1)*
41. Trailer, equipment (1)*
42. Trailer, goose neck equipment (1)*
43. Trailer, water (1)*
44. Trailer, cotton (1)*

45. Trailer, small grain transport (1)*
46. Truck, 3/4 - 1 ton, (equipped with tool boxes) (1)*
47. Vise, bench (2)*
48. Welder/torch, oxyacetylene (2)
49. Table, gas welding (1)
50. Table, shop (4)
51. Utility Vehicle (with trailer) (1)

* Used equipment is acceptable provided it is available and in satisfactory condition.

NON-CAPITALIZED ITEMS

1. Anvil (1)*
2. Chain hoist (1)*
3. Probe, grain (2)
4. Tester, grain moisture (2)

* Used equipment is acceptable provided it is available and in satisfactory condition.

Additional Tools and Equipment for Maintenance and Repair Courses

CAPITALIZED ITEMS

1. Air compressor
2. Arc welder (MIG and/or flux core) (2)
3. Band saw, metal (1)
4. Arbor press (1)
5. Drill press (1)
6. Plasma arc cutter (1)
7. Oxyfuel cutting and welding set (1)
8. Bench grinder (1)
9. Surface grinder (1)
10. Parts washer (1)
11. Hand tools, assorted English (1)
12. Hand tools, assorted metric (1)
13. Chop saw (1)
14. Pipe bender (1)
15. Hot air welder (1)
16. Utility Vehicle (with trailer) (1)

NON-CAPITALIZED ITEMS

1. Vise, bench (2)
2. Table, shop (4)
3. Pipe threader (1)
4. Table, gas welding (1)

Additional Tools and Equipment for Precision Agriculture Technology Option

CAPITALIZED ITEMS

1. Agriculture-specific application for Smartphones (1 per student and 1 for instructor)

2. Wide format color printer, copier, and scanner (Network accessible)
3. Color scanner with software
4. Geographical information system software package with spatial analysis and geo-processing tools
5. Office suite with word processing, spreadsheet, presentation, and database
6. VRT chemical applicator (Demonstration version or access to required)
7. High precision GNSS unit
8. Autonomous UAV camera and software

RECOMMENDED INSTRUCTIONAL AIDS

It is recommended that instructors have access to the following items:

1. Digital camera (1)
2. Smart board (1)
3. VCR/DVD player (1)
4. Data projector (1)
5. High speed Internet access (Cable, T1, or DSL)
6. Imagery data provider (Aerial and/or satellite)

CURRICULUM DEFINITIONS AND TERMS

- Course Name – A common name that will be used by all community colleges in reporting students
- Course Abbreviation – A common abbreviation that will be used by all community and junior colleges in reporting students
- Classification – Courses may be classified as the following:
 - Career Certificate Required Course – A required course for all students completing a career certificate.
 - Technical Certificate Required Course – A required course for all students completing a technical certificate.
 - Technical Elective – Elective courses that are available for colleges to offer to students.
- Description – A short narrative that includes the major purpose(s) of the course
- Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course
- Corequisites – A listing of courses that may be taken while enrolled in the course
- Student Learning Outcomes – A listing of the student outcomes (major concepts and performances) that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:

- The content of the courses in this document reflects approximately 75% of the time allocated to each course. The remaining 25% of each course should be developed at the local district level and may reflect the following:
 - Additional competencies and objectives within the course related to topics not found in the state framework, including activities related to specific needs of industries in the community college district
 - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
 - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed or revised
 - Activities that include integration of academic and career–technical skills and course work, school-to-work transition activities, and articulation of secondary and postsecondary career–technical programs
 - Individualized learning activities, including work-site learning activities, to better prepare individuals in the courses for their chosen occupational areas
- Sequencing of the course within a program is left to the discretion of the local college. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors. Programs that offer an Associate of Applied Science Degree must include all of the required Career Certificate courses, Technical Certificate courses **AND** a minimum of 15 semester hours of General Education Core Courses. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester. Each community college specifies the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college.
- In order to provide flexibility within the districts, individual courses within a framework may be customized by doing the following:

- Adding new student learning outcomes to complement the existing competencies and suggested objectives in the program framework
- Revising or extending the student learning outcomes
- Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the Mississippi Community College Board [MCCB] of the change)