

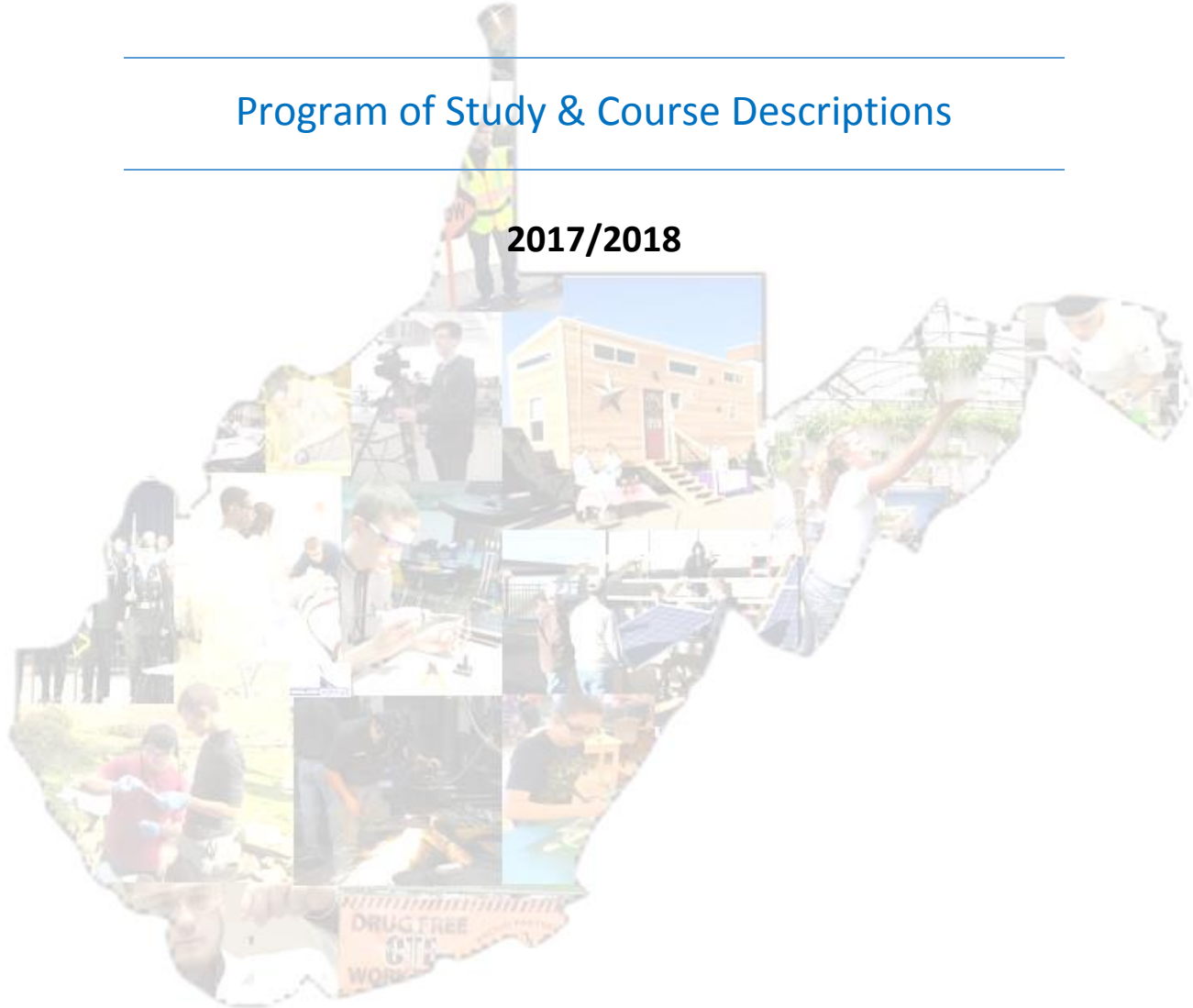
# Agriculture, Food and Natural Resources

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Program of Study & Course Descriptions

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2017/2018



West Virginia DEPARTMENT OF  
EDUCATION



## Table of Contents

Agribusiness Systems Pathway .....	5
Program of Study: AG0120 Agribusiness Systems .....	5
Animal Systems Pathway .....	10
Program of Study: AG0220 Animal Systems .....	10
Program of Study: AG0221 CASE Animal Science .....	14
Program of Study: AG0223 Pet Grooming .....	18
Food Products and Processing Systems Pathway .....	20
Program of Study: AG0230 Animal Processing .....	20
Natural Resources Systems Pathway .....	23
Program of Study: AG2185 Chemical, Energy and Mechanical Technologies .....	23
Program of Study: AG0130 Forest Industry .....	26
Program of Study: AG0170 Natural Resources Management .....	28
Plant Systems Pathway .....	31
Program of Study: AG0210 Plant Systems .....	31
Program of Study: AG0215 CASE Plant Science .....	35
Power, Structural and Technical Systems Pathway .....	39
Program of Study: AG0110 Power, Structural and Technical Systems .....	39
Agriculture, Food and Natural Resources Cluster Electives .....	42
Agribusiness Systems Pathway .....	42
Program of Study: AG0120 Agribusiness Systems .....	42
Animal Systems Pathway .....	44
Program of Study: AG0220 Animal Systems .....	44
Program of Study: AG0221 CASE Animal Science .....	45

Program of Study:	AG0223 Pet Grooming.....	45
	Food Products and Processing Pathway .....	47
Program of Study:	AG0230 Animal Processing.....	47
	Natural Resources Systems Pathway .....	49
Program of Study:	AG2185 Chemical, Energy and Mechanical Technologies .....	49
Program of Study:	AG0130 Forest Industry.....	49
Program of Study:	AG0170 Natural Resources Management .....	50
	Plant Systems Pathway .....	52
Program of Study:	AG0210 Plant Systems .....	52
	Power, Structural and Technical Systems Pathway .....	54
Program of Study:	AG0110 Power, Structural and Technical Systems.....	54
Middle School Career Technical Education Courses .....		57

## **Agriculture, Food, and Natural Resources Cluster**

### **Cluster Description:**

The agricultural education program is built on the three core areas of classroom/laboratory instruction, supervised agricultural experience programs and FFA student organization activities/opportunities. The program is designed for delivery through these three components as follows:

- Classroom/Laboratory Instruction – quality instruction in and about agriculture that utilizes a "learning by doing" philosophy.
- Supervised Agricultural Experience Programs – all students are expected to have an agriculturally related work-based learning experience while enrolled in agricultural education courses.
- FFA Student Organization activities/opportunities – FFA activities are an integral part of the agricultural education program that all agricultural education students should participate in if they are to fully benefit from their enrollment in the program.

A quality agricultural education program has a balanced utilization of these three core components. These components are best carried out when the following strategies are employed:

- Community-Based Planning – involvement of the school administration and community in the planning and coordination of the program is essential to success.
- Professional Development – agriculture teachers take advantage of opportunities for professional development and growth.
- Partnerships – the development of alliances with community and business leaders is essential for program success.
- Marketing – every agricultural education program needs a successful marketing strategy in place to attract and retain students and the support of the community that is being served.

When these components and strategies are in place, program success will occur.

## Agribusiness Systems Pathway

### Pathway Description:

The Agribusiness Systems pathway focuses on entrepreneurial and technical skills and careers in the broad spectrum of Agriculture, Food, and Natural Resources.

**Program of Study:** AG0120 Agribusiness Systems

**Courses:** 0101 Introduction to Agriculture, Food, and Natural Resources  
or 0161 CASE Introduction to Agriculture, Food, and Natural Resources  
0102 The Science of Agriculture  
0134 Agricultural Experience Program  
Agribusiness Specialization

### Program of Study Description:

The Agribusiness Systems Program of Study focuses on entrepreneurial and technical skills and careers in the broad spectrum of Agriculture, Food, and Natural Resources. This Program of Study offers the most flexibility of all agriculture Programs of Study for students to select a specialization from many areas: Forestry, Horticulture, Advanced Agriculture Principles, Animal Science, Agriculture Mechanics, Animal Processing, Natural Resources, Biotechnology, Entrepreneurship and Food Science.

### Course Descriptions:

#### **0101 Introduction to Agriculture, Food, and Natural Resources**

This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food and natural resources careers. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0161 CASE Introduction to Agriculture, Food and Natural Resources**

*Introduction to Agriculture, Food, and Natural Resources (AFNR)* introduces students to the range of agricultural opportunities and the pathways of study they may pursue. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE™ curriculum.

Woven throughout the course are activities to develop and improve employability skills of students through practical applications. Students will explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course will experience hands-on activities, projects, and problems. Student experiences will involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students will learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students will work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, Food, and Natural Resources* course is intended to serve as the introductory course within the CASE Program of Study. The course is structured to enable all students to have a variety of experiences that will provide an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0102 The Science of Agriculture**

This course focuses on the basic scientific principles and processes related to the production of plants and animals for the food and fiber systems. Topics of instruction include basic understanding of the livestock/poultry industry and its various components, career opportunities, soil science, crop science/agronomy, weed science, basic agricultural mechanics and related industry careers, environmental stewardship, entrepreneurship, and leadership/personal development. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0134 Agricultural Experience Program**

The Supervised Agricultural Experience program is a hands-on, student planned way for them to apply skills learned in the classroom to real world agricultural experiences. With help from

their agricultural teachers, students develop an SAE project based on one or more SAE categories: **Entrepreneurship, Placement, Research and Experimentation** and **Exploratory**.

***Agribusiness Specialization: Choose One***

**0183 Forest Management**

This course is designed to be a basic forestry course for students interested in forestry. The course will covers topics on best management practices, timber felling basics, dendrology, tree measurement basics, water quality, forest fire, read topography maps and basic log road layout, forest hazards ID, basic forestry concepts of edge, diversity, succession and structure, forest business and economics, forest insects, forest disease, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**0212 Horticulture**

This course provides instruction on the broad field of horticulture with emphasis on the scientific and technical knowledge for a career in horticulture. Topics in this course include plant growth and development, plant nutrition, media selection, basic plant identification, pest management, chemical disposal, customer relations, career opportunities, leadership development and entrepreneurial skills. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**0136 Advanced Principles of Agriculture**

This course provides instruction that expands the scientific knowledge and technical skills gained in The Science of Agriculture. Topics of instruction include livestock/poultry industry and its various components, career opportunities, soil science, crop science/agronomy, weed science, agricultural machinery and related industry careers, environmental stewardship, entrepreneurship, and leadership/personal development. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**0140 Animal Production and Management**

This course is designed to be a core course in the Animal Systems Program of Study. The course will cover topics on animal restraint, animal management techniques, animal health and welfare, balancing rations, pedigree analysis, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0112 Fundamentals of Agriculture Mechanics**

This course introduces the knowledge and skills for applying the physical science principles and principles of operation and maintenance to mechanical equipment, welding and fabrication, structures, plumbing, electrical wiring, power utilization, entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0139 Fundamentals of Animal Processing**

This course introduces students to the principles and applications of animal processing. Students will learn carcass grading, primal and retail cuts, workplace safety, how to process primal and retail cuts, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0200 Natural Resource Management**

This specialization course covers topics on soil and water conservation, basic wildlife management, environmental law and regulations, basic forestry, and land management. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0132 Agricultural Biotechnology**

This course provides instruction in the technologically advanced world of agriculture and life sciences. Current applications of biotechnology in animal science, environmental science, food science, and plant science are emphasized. Basic concepts of genetics and microbiology are



applied to the agriculture industry and its success in providing food and fiber for the world. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0110 Agriculture Entrepreneurship**

This specialization course is for students who seek business and management techniques that will enable them to become successful in owning and operating a business in the agriculture industry. Topics covered include business organizational structures, legal and financial aspects of entrepreneurship, and marketing. Students will utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts and develop a business plan for an agricultural enterprise. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education.

### **0111 Food Science Technology**

This specialization course is for students who seek a deeper knowledge in the area of food science technology. Topics covered include food safety, business and economics, packaging and marketing, value-added processing, quality assurance, food processing, food preparation and presentation and careers in the food science industry. Students will utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education.

## Animal Systems Pathway

### Pathway Description:

The Animal Systems pathway focuses on entrepreneurial and technical skills and careers in the areas of animal production and management, animal science, livestock production, aquaculture, equine science and companion animal care.

**Program of Study:** AG0220 Animal Systems

**Courses:** 0101 Introduction to Agriculture, Food and Natural Resources  
or 0161 CASE Introduction to Agriculture, Food, and Natural Resources  
0140 Animal Production and Management  
0134 Agricultural Experience Program  
Animal Systems Specialization

### Program of Study Description:

The Animal Systems Program of Study focuses on entrepreneurial and technical skills and careers in the areas of animal production and management, animal science, livestock production, aquaculture, equine science and companion animal care. The Program of Study offers four unique specializations. Specializations are offered in Livestock Production, Companion Animal Care, Aquaculture and Equine Science.

### Course Descriptions:

#### **0101 Introduction to Agriculture, Food and Natural Resources**

This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food, and natural resources careers. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0161 CASE Introduction to Agriculture, Food and Natural Resources**

*Introduction to Agriculture, Food, and Natural Resources (AFNR)* introduces students to the range of agricultural opportunities and the pathways of study they may pursue. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE™ curriculum.

Woven throughout the course are activities to develop and improve employability skills of students through practical applications. Students will explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course will experience hands-on activities, projects, and problems. Student experiences will involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students will learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students will work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, Food, and Natural Resources* course is intended to serve as the introductory course within the CASE Program of Study. The course is structured to enable all students to have a variety of experiences that will provide an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0140 Animal Production and Management**

This course is designed to be a core course in the Animal Systems Program of Study. The course will cover topics on animal restraint, animal management techniques, animal health and welfare, balancing rations, pedigree analysis and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0134 Agricultural Experience Program**

The Supervised Agricultural Experience program is a hands-on, student planned way for them to apply skills learned in the classroom to real world agricultural experiences. With help from their agricultural teachers, students develop an SAE project based on one or more SAE categories: **Entrepreneurship, Placement, Research and Experimentation** and **Exploratory**.

#### ***Animal Systems Specialization: Choose One***

### **0230 Livestock Production**

This is a specialization course designed for students interested in entering the livestock industry as a herd manager or livestock entrepreneur. The course will cover topics on nutrient management, farm planning, business planning, developing marketing plans, developing feed rations, forages, grassland management, embryo transfer and animal facilities as they apply to various livestock such as cattle, swine, sheep, goats, poultry and horses. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0149 Companion Animal Care**

This is a specialization course designed for students interested in entering the companion animal industry as a pet groomer, animal care giver and/or companion animal entrepreneur. The course will cover topics on grooming, animal restraint, developing feed rations, business planning, developing marketing plans and animal facilities as they apply to various companion animals such as dogs, cats, rodents, birds, reptiles, amphibians and fish. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0141 Aquaculture**

This specialization course focuses on the basic scientific principles and processes related to the aquaculture industry. Topics covered will be developing feed rations, business planning, developing marketing plans aquaculture facilities, water quality, breeding and management. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **2007 Equine Science**

This specialization course focuses on the basic scientific principles and processes related equine physiology, breeding, nutrition, and management practices involved in the equine industry. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**0170 Introduction to Pet Grooming, Boarding, and Obedience**

The Introduction to Pet Grooming, Boarding and Obedience course is an introductory course to the Pet Grooming concentration designed for students to gain basic understanding of the each of these three segments of the pet industry. The performance skill sets will focus on students performing basic bathing and drying of dogs and cats.

**Program of Study:** AG0221 CASE Animal Science

**Courses:** 0161 CASE Introduction to Agriculture, Food and Natural Resources  
0162 CASE Principles of Agriculture Science-Animal  
0134 Agriculture Experience Program  
CASE Animal Science Specialization

**Program of Study Description:**

CASE program of study pathways are carefully designed to scaffold student learning within a course and throughout the pathway. Similar to all CASE pathways, the animal science pathway begins with the *Introduction to Agriculture, Food, and Natural Resources* course. Students then progress to the foundation level course, *Principles of Agricultural Science - Animal*. Next, students have the option to complete either the *Animal and Plant Biotechnology* or *Food Science and Safety* specialization level course. All CASE pathways culminate with the capstone course, *Agricultural Research and Development*.

**Course Descriptions:**

**0161 CASE Introduction to Agriculture, Food and Natural Resources**

*Introduction to Agriculture, Food, and Natural Resources* (AFNR) introduces students to the range of agricultural opportunities and the pathways of study they may pursue. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE™ curriculum.

Woven throughout the course are activities to develop and improve employability skills of students through practical applications. Students will explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course will experience hands-on activities, projects, and problems. Student experiences will involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students will learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students will work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, Food, and Natural Resources* course is intended to serve as the introductory course within the CASE Program of Study. The course is structured to enable all students to have a variety of experiences that will provide an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0162 CASE Principles of Agriculture Science-Animal**

*Principles of Agricultural Science—Animal* is a foundation-level course designed to engage students in hands-on laboratories and activities to explore the world of animal agriculture. Throughout the course, students will develop a comprehensive Producer’s Management Guide for an animal of their choice.

Student experiences will involve the study of animal anatomy, physiology, behavior, nutrition, reproduction, health, selection, and marketing. For example, students will acquire skills in meeting the nutritional needs of animals while developing balanced, economical rations. Throughout the course, students will consider the perceptions and preferences of individuals within local, regional, and world markets.

Students will explore hands-on projects and activities to learn the characteristics of animal science and work on major projects and problems similar to those that animal science specialists, such as veterinarians, zoologists, livestock producers, and industry personnel, face in their respective careers. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Teachers are provided detailed professional development to facilitate instruction. Every lesson is aligned with national standards for agriculture, science, mathematics, and English language arts.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### ***CASE Animal Science Specialization: Choose One***

#### **0164 CASE Animal and Plant Biotechnology \***

*Animal and Plant Biotechnology*, a specialization course in the CASE Program of Study, provides students with experiences in industry appropriate applications of biotechnology related to plant and animal agriculture. Students will complete hands-on activities, projects, and problems designed to build content knowledge and technical skills in the field of biotechnology.

Students are expected to become proficient at biotechnological skills involving micropipetting, bacterial cultures and transformations, electrophoresis, and polymerase chain reaction.

Students will maintain a research level Laboratory Notebook throughout the course documenting their experiences in the laboratory. Research and experimental design will be highlighted as students develop and conduct industry appropriate investigations.

Students will develop and conduct a research project following the National FFA Agriscience Fair guidelines. From background research through data collection and analysis, students will investigate a problem of their choice and conclude the project by reporting their results in the forms of a research paper and a research poster.

CASE resources and professional development provide extensive preparation for the teacher to be proficient and confident in their ability to provide proper instruction of biotechnology skills and concepts.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

\*This course fulfills the requirement for a third science course graduation requirement

### **0165 CASE Food Science and Safety**

*Food Science and Safety* is a specialization course in the CASE Program of Study. Students will complete hands-on activities, projects, and problems that simulate actual concepts and situations found in the food science and safety industry, allowing students to build content knowledge and technical skills. Students will investigate areas of food science including food safety, food chemistry, food processing, food product development, and marketing.

Students will maintain a research level Laboratory Notebook throughout the course documenting their experiences in the laboratory. Research and experimental design will be highlighted as students develop and conduct industry appropriate investigations.

In addition, students will explore connections between the *Food Science and Safety* lessons, Supervised Agricultural Experience, and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0163 CASE Agriculture Business, Research and Development**



*Agricultural Research and Development* is the capstone course designed to culminate students' experiences in agriculture, based on the pathway of study they pursued.

Woven throughout the course are projects and problems based in practical applications and designed to develop and improve employability skills of students. Students will further enhance critical thinking and teamwork skills as they expand on content knowledge from previous CASE courses.

**Program of Study:** AG0223 Pet Grooming

**Courses:** 0170 Introduction to Pet Grooming, Boarding and Obedience  
0171 Pet Grooming and Understanding Personalities  
0173 Pet Grooming, Boarding and Obedience Entrepreneurship  
Pet Grooming Specialization

**Program of Study Description:**

Dog grooming begins with learning how to use various pet grooming tools. The pet grooming curriculum teaches students how to safely groom dogs while maintaining a calm, relaxing environment. As a student enrolled in the dog grooming program of study, student will receive a complete overview and instructional setting to utilize the pet grooming toolkit. The toolkit will permit students practical application using: clippers, blades, shears, brushes, combs, shampoo, conditioner and more. This high-quality equipment is essential for every groomer's toolbox and can be used when you start your new career.

**Course Descriptions:**

**0170 Introduction to Pet Grooming, Boarding and Obedience**

The Introduction to Pet Grooming, Boarding and Obedience course is an introductory course to the Pet Grooming concentration designed for students to gain basic understanding of the each of these three segments of the pet industry. The performance skill sets will focus on students performing basic bathing and drying of dogs and cats.

**0171 Pet Grooming and Understanding Personalities**

The Pet Grooming and Understanding Personalities course is a core course in the Pet Grooming concentration designed for students to gain a deeper understanding of the pet grooming laboratory and the anatomy of canines and felines as well and the health, nutrition, reproduction and behavior of these animals. Students will perform more advanced grooming techniques on animals.

**0173 Pet Grooming, Boarding and Obedience Entrepreneurship**

This specialization course is for students who seek business and management techniques that will enable them to become successful in owning and operating a business in the pet grooming, obedience and boarding industries. Topics covered include business organizational structures, legal and financial aspects of entrepreneurship, and marketing. Students will utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts and develop a business plan.

***Pet Grooming Specialization: Choose One***

**1180 Advanced Pet Grooming and Understanding Personalities**

The Advanced Pet Grooming course is an advanced specialization course designed for students to create a pet grooming business within the Simulated Workplace environment. Students will manage and operate a pet grooming business in the school laboratory.

**1181 Pet Boarding and Obedience**

The Pet Boarding and Obedience course is an advanced specialization course designed for students to create a pet boarding and obedience business within the Simulated Workplace environment. Students will manage and operate a pet boarding and obedience business in the school laboratory.

## Food Products and Processing Systems Pathway

### Pathway Description:

The Food Products and Processing Systems pathway focuses on entrepreneurial and technical skills and careers in the animal processing industry.

**Program of Study:** AG0230 Animal Processing

**Courses:** 0101 Introduction to Agriculture, Food, and Natural Resources  
or CASE Introduction to Agriculture, Food, and Natural Resources  
0139 Fundamentals of Animal Processing  
0134 Agricultural Experience Program  
One Animal Processing Specialization

### Program of Study Description:

The Animal Processing Systems pathway focuses on entrepreneurial and technical skills and careers in the animal processing industry. Specializations for this Program of Study prepare students for the retail industry and the commercial plant industry.

### Course Descriptions:

#### **0101 Introduction to Agriculture, Food, and Natural Resources**

This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food and natural resources careers and Cluster Foundation Knowledge and Skills. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0161 CASE Introduction to Agriculture, Food and Natural Resources**

*Introduction to Agriculture, Food, and Natural Resources (AFNR)* introduces students to the range of agricultural opportunities and the pathways of study they may pursue. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE™ curriculum.

Woven throughout the course are activities to develop and improve employability skills of students through practical applications. Students will explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course will experience hands-on activities, projects, and problems. Student experiences will involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students will learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students will work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, Food, and Natural Resources* course is intended to serve as the introductory course within the CASE Program of Study. The course is structured to enable all students to have a variety of experiences that will provide an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0139 Fundamentals of Animal Processing**

This course introduces students to the principles and applications of animal processing. Students will learn carcass grading, primal and retail cuts, workplace safety, how to process primal and retail cuts, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0134 Agricultural Experience Program**

The Supervised Agricultural Experience program is a hands-on, student planned way for them to apply skills learned in the classroom to real world agricultural experiences. With help from their agricultural teachers, students develop an SAE project based on one or more SAE categories: **Entrepreneurship, Placement, Research and Experimentation** and **Exploratory**.

### ***Animal Processing Specialization: Choose One***

**0151 Animal processing—Retail**

This course is designed to give students the skills and knowledge needed to enter a career in the retail industry of animal processing. This course will build upon the concepts learned in Fundamentals of Animal Processing and emphasize retail cut processing, creating value added products, working with the public, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**0160 Animal Processing--Plant**

This course is designed to give students the skills and knowledge needed to enter a career in an animal processing plant. This course will build upon the concepts learned in Fundamentals of Animal Processing and emphasize primal cut processing, workplace safety, government regulations, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

## Natural Resources Systems Pathway

### Pathway Description:

The Natural Resources Management pathway focuses on entrepreneurial and technical skills and careers in the areas natural resources management.

Program of Study: **AG2185 Chemical, Energy and Mechanical Technologies**

**Courses:** 2497 Basic Production Mechanics  
2496 Advanced Production Mechanics  
Two Chemical, Energy and Mechanical Technologies Specializations

### Program of Study Description:

The Chemical, Energy and Mechanical Technologies Program of Study prepares students for gainful employment in the Oil and Gas Industry. Depending on the specific job related needs, students will apply mathematical, scientific and problem based learning activities that are involved in the production and distribution of oil and gas. Students will learn safety, earn their rig pass certification, and explore the soft skills needed to prepare them for gainful employment in a competitive global marketplace. Courses can be selected depending on demographic/industry needs.

### Course Descriptions:

#### **2497 Basic Production Mechanics**

This is a core course for the Chemical, Energy and Mechanical Technologies Program of Study that builds a knowledge base and technical skills in the mechanical aspects of the industry. Topics include: NCCER Core, Masonry, Fasteners, Tubing and Threaded Pipe, Electrical systems, and welding. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members in the appropriate CTSO. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **2496 Advanced Production Mechanics**

This is a core course for the Chemical, Energy and Mechanical Technologies Program of Study that builds a knowledge base and technical skills in the more advanced mechanical aspects of the industry. Topics include: Pneumatics, Hydraulics, Metering devices and provers, Pumps, Gas compressors, Bearings and seals, Valves, Threaded pipe fabrication, Materials handling, Basic Rigging, Oxy-Fuel cutting, Motorized, and Forklifts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members in the appropriate CTSO. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

## ***Chemical, Energy and Mechanical Technologies Specialization: Choose Two***

### **2493 Electrical Maintenance for Energy and Mining**

This course introduces the student to the knowledge base and technical skills for concepts in electrical maintenance for jobs in the energy and mining industries. Areas of study include electrical safety, mathematical applications, and basic electrical concepts. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organizations, WV SkillsUSA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **1871 Electrical Maintenance**

This course introduces the student to the knowledge base and technical skills for entry level skills in industrial Electrical Maintenance. Areas of study include basic electrical theory and calculations, electrical tools, instruments and safety, electrical symbols and diagrams, industrial power and control circuits, electrical equipment and devices, electrical motors, and an introduction to programmable logic controllers, as applied in industrial locations. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organizations, WV SkillsUSA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0112 Fundamentals of Agricultural Mechanics**

This course introduces the knowledge and skills for applying the physical science principles and principles of operation and maintenance to mechanical equipment, welding and fabrication, structures, plumbing, electrical wiring, power utilization, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0114 Agriculture Equipment and Repair**

This course builds on the principles of the previous course and provides more in-depth knowledge and skills as they relate to energy sources, lubricants, service and maintenance of machinery and equipment, and equipment operation. Students will apply principles of service and repair by troubleshooting problems and evaluating engine performance, follow guidelines



to service and repair power transmission systems, hydraulic systems, and entrepreneurship. Tools used with these procedures will allow students to demonstrate proper skills and safety. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **2449 Chemical Process Control**

The Chemical Process Control course is an introductory course designed for students to gain basic understanding of the science, equipment, processes and safety encountered in a chemical plant. The performance skill sets are written so students will conduct some basic hands-on experiments with chemical processes and manipulate various pieces of equipment such as valves and pumps to gain an understanding of parts, functions and role of each.

#### **1808 Electronic Instrumentation**

This course introduces the student to the knowledge base and technical skills for entry level skills in Electronic Instrumentation. Areas of study include introduction to programmable logic controllers, sensors, relays and starters, voltage and current measurement, and electromagnetism. Emphasis will be placed on career exploration, job seeking skills, and personal and professional ethics. Safety instruction is integrated into all activities. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organizations, WV SkillsUSA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **2450 Fundamentals of Energy Systems**

The Fundamental of Energy Systems course is an introductory course designed for students to be introduced to the Energy Industry. Students will gain an understanding of a variety of energy sources such as natural gas, coal, biomass, solar, wind, and many more and their uses and the importance of energy conservation and how energy is then converted into electricity.

Program of Study: **AG0130 Forest Industry**

**Courses:** 0182 Fundamentals of Forestry  
0183 Forest Management  
0184 Timber Management  
0185 Advanced Principles of Forestry

**Program of Study Description:**

The Forest Industry Program of Study focuses on entrepreneurial and technical skills and careers in the areas forest management. The Program of Study is available for forest industry certified instructors to teach a more in depth curriculum in Forestry.

**Course Descriptions:**

**0182 Fundamentals of Forestry**

This is the foundational course in the Forest Industry Program of Study. Learners will be exposed to a broad range of forestry topics including: dendrology, wildlife, forest fire and basic forest measurements. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**0183 Forest Management**

This course is designed to be a basic forestry course for students interested in forestry. The course will covers topics on best management practices, timber felling basics, dendrology, tree measurement basics, water quality, forest fire, read topography maps and basic log road layout, forest hazards ID, basic forestry concepts of edge, diversity, succession and structure, forest business and economics, forest insects, forest disease, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**0184 Timber Management**

This course is an advanced course in the Forest Industry Program of Study. The course will allow students to cover the topics of timber management, measurement and evaluation and logging practices in depth utilizing problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0185 Advanced Principles of Forestry**

This course is an advanced course in the Forest Industry Program of Study. The course will cover topics on woodlot management, forest disease and pests and forest land management. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**Program of Study:** AG0170 Natural Resources Management

**Courses:** 0101 Introduction to Agriculture, Food and Natural Resources  
or CASE Introduction to Agriculture, Food, and Natural Resources  
0200 Natural Resources Management  
0134 Agricultural Experience Program  
Natural Resources Management Specialization

### **Program of Study Description:**

The Natural Resources Management Program of Study focuses on entrepreneurial and technical skills and careers in the areas natural resources management. Specializations are offered for in the areas of forestry, wildlife management and land management.

### **Course Descriptions:**

#### **0101 Introduction to Agriculture, Food and Natural Resources**

This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food, and natural resources careers. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0161 CASE Introduction to Agriculture, Food and Natural Resources**

*Introduction to Agriculture, Food, and Natural Resources (AFNR)* introduces students to the range of agricultural opportunities and the pathways of study they may pursue. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE™ curriculum.

Woven throughout the course are activities to develop and improve employability skills of students through practical applications. Students will explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course will experience hands-on activities, projects, and problems. Student experiences will involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students will learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students will work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, Food, and Natural Resources* course is intended to serve as the introductory course within the CASE Program of Study. The course is structured to enable all students to have a variety of experiences that will provide an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0200 Natural Resources Management**

This specialization course covers topics on soil and water conservation, basic wildlife management, environmental law and regulations, basic forestry, and land management. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0134 Agricultural Experience Program**

The Supervised Agricultural Experience program is a hands-on, student planned way for them to apply skills learned in the classroom to real world agricultural experiences. With help from their agricultural teachers, students develop an SAE project based on one or more SAE categories: **Entrepreneurship, Placement, Research and Experimentation** and **Exploratory**.

### ***Natural Resources Management Specialization: Choose One***

### **0183 Forest Management**

This course is designed to be a basic forestry course for students interested in forestry. The course will covers topics on best management practices, timber felling basics, dendrology, tree measurement basics, water quality, forest fire, read topography maps and basic log road layout, forest hazards ID, basic forestry concepts of edge, diversity, succession and structure, forest business and economics, forest insects, forest disease, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0190 Fish and Wildlife Management**

This specialization course covers topics on advanced wildlife management principles, water quality, fish biology, history of fish and wildlife, habitat management, life history and wildlife values as a natural resources. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **2494 Land Management and Surveying**

This specialization course covers topics in land management and surveying to prepare students for land management careers in the vast natural resources industry. Topics include: geophysical data, surveying, mapping, and title examination and searching. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **2498 Arboriculture and Urban Forestry**

The Arboriculture and Urban Forestry course is a specialization course designed for students to gain understanding of the management of trees in urban forest environments. The performance skill sets are written so students will identify, select, plant, prune and maintain trees and monitor tree health.

### **2499 Water Operator-in-Training**

The Water Operator-in-Training course is designed for students to gain basic understanding of the operation of a municipal water treatment plant. The skill sets are designed to give students the content knowledge of operating a water treatment plant so they may then gain apprenticeship hours at an actual plant to become certified

### **2500 Waste Water Operator-in-Training**

The Waste Water Operator-in-Training course is designed for students to gain basic understanding of the operation of a municipal waste water treatment plant. The skills sets are designed to give students the content knowledge of operating a waste water treatment plant so they may then gain apprenticeship hours at an actual plant to become certified

## Plant Systems Pathway

### Pathway Description:

The Plant Systems pathway focuses on entrepreneurial and technical skills and careers in the areas of plant science, greenhouse management and production, fruit and vegetable production, floriculture and turf and landscape systems.

### Program of Study: AG0210 Plant Systems

**Courses:** 0101 Introduction to Agriculture, Food and Natural Resources  
**or** CASE Introduction to Agriculture, Food, and Natural Resources  
0212 Horticulture  
**or** CASE Principles of Agricultural Science – Plant  
0134 Agricultural Experience Program  
Plant Systems Specialization

### Program of Study Description:

The Plant Systems Program of Study focuses on entrepreneurial and technical skills and careers in the areas of plant science, greenhouse management and production, fruit and vegetable production, floriculture and turf and landscape systems. The Program of Study offers four unique specializations. Specializations are offered in Fruit and Vegetable Production, Greenhouse Production and Management, Floriculture and Turf and Landscape Systems.

### Course Descriptions:

#### **0101 Introduction to Agriculture, Food and Natural Resources**

This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food, and natural resources careers. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0161 CASE Introduction to Agriculture, Food and Natural Resources**

*Introduction to Agriculture, Food, and Natural Resources (AFNR)* introduces students to the range of agricultural opportunities and the pathways of study they may pursue. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE™ curriculum.

Woven throughout the course are activities to develop and improve employability skills of students through practical applications. Students will explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course will experience hands-on activities, projects, and problems. Student experiences will involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students will learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students will work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, Food, and Natural Resources* course is intended to serve as the introductory course within the CASE Program of Study. The course is structured to enable all students to have a variety of experiences that will provide an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0212 Horticulture**

This course provides instruction on the broad field of horticulture with emphasis on the scientific and technical knowledge for a career in horticulture. Topics in this course include plant growth and development, plant nutrition, media selection, basic plant identification, pest management, chemical disposal, customer relations, career opportunities, leadership development and entrepreneurial skills. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0166 CASE Principles of Agriculture Science-Plant\***

*Principles of Agricultural Science—Plant* is a foundation-level course that will teach students about the form and function of plant systems. Students are immersed in inquiry-based



exercises filled with activities, projects, and problems to teach them plant concepts through laboratory and practical experiences. Student experiences will include the study of plant anatomy and physiology, classification, and the fundamentals of production and harvesting.

Students will learn how to apply scientific knowledge and skills to use plants effectively for agricultural and horticultural production. Students will discover the value of plant production and its impact on the individual, the local, and the global economy.

Lessons throughout the course will provide an overview of the field of agricultural science with a foundation in plant science. These lessons include working in teams and exploring hands-on projects. Students will work on major projects and problems similar to those that plant science specialists, such as horticulturalists, agronomists, greenhouse and nursery managers, and plant research specialists, face in their respective careers.

Teachers are provided detailed professional development to facilitate instruction. Every lesson is aligned with national standards for agriculture, science, mathematics, and English language arts

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

\*This course fulfills the requirement for a third science course graduation requirement

### **0134 Agricultural Experience Program**

The Supervised Agricultural Experience program is a hands-on, student planned way for them to apply skills learned in the classroom to real world agricultural experiences. With help from their agricultural teachers, students develop an SAE project based on one or more SAE categories: **Entrepreneurship, Placement, Research and Experimentation** and **Exploratory**.

### ***Plant Systems Specialization: Choose One***

#### **0220 Fruit and Vegetable Production**

This specialization course covers topics on plant nutrition, site preparation, plant selection, harvesting, equipment, value-added agriculture, insect and disease identification and control, food safety, soil management, entrepreneurship and animal control. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0214 Greenhouse Production and Management**

This specialization course covers instruction that expands the scientific knowledge and skills to include more advanced scientific computations and communication skills needed in the horticulture industry. Topics include greenhouse plant production and management, bedding plant production, watering systems light effects, career planning, leadership development and entrepreneurial skills. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0213 Floriculture**

This specialization course covers topics on floral design, business planning, market plan development, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0240 Turf and Landscape Systems**

This specialization course covers topics on lawn care and turf production, golf course management, irrigation systems, turf equipment and maintenance, landscape design, landscape plants, landscape maintenance, plant pruning, marketing, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**Program of Study:** AG0215 CASE Plant Science

**Courses:** 0161 CASE Introduction to Agriculture, Food and Natural Resources  
0166 CASE Principles of Agriculture Science-Plant  
0134 Agricultural Experience Program  
CASE Plant Science Specialization

**Program of Study Description:**

CASE program of study pathways are carefully designed to scaffold student learning within a course and throughout the pathway. Similar to all CASE pathways, the plant science pathway begins with the *Introduction to Agriculture, Food, and Natural Resources* course. Students then progress to the foundation level course, *Principles of Agricultural Science - Plant*. Next, students have the option to complete either the *Animal and Plant Biotechnology* or *Food Science and Safety* specialization level course. All CASE pathways culminate with the capstone course, *Agricultural Research and Development*.

**Course Descriptions:**

**0161 CASE Introduction to Agriculture, Food and Natural Resources**

*Introduction to Agriculture, Food, and Natural Resources* (AFNR) introduces students to the range of agricultural opportunities and the pathways of study they may pursue. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE™ curriculum.

Woven throughout the course are activities to develop and improve employability skills of students through practical applications. Students will explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course will experience hands-on activities, projects, and problems. Student experiences will involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students will learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students will work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, Food, and Natural Resources* course is intended to serve as the introductory course within the CASE Program of Study. The course is structured to enable all students to have a variety of experiences that will provide an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0166 CASE Principles of Agriculture Science-Plant\***

*Principles of Agricultural Science—Plant* is a foundation-level course that will teach students about the form and function of plant systems. Students are immersed in inquiry-based exercises filled with activities, projects, and problems to teach them plant concepts through laboratory and practical experiences. Student experiences will include the study of plant anatomy and physiology, classification, and the fundamentals of production and harvesting.

Students will learn how to apply scientific knowledge and skills to use plants effectively for agricultural and horticultural production. Students will discover the value of plant production and its impact on the individual, the local, and the global economy.

Lessons throughout the course will provide an overview of the field of agricultural science with a foundation in plant science. These lessons include working in teams and exploring hands-on projects. Students will work on major projects and problems similar to those that plant science specialists, such as horticulturalists, agronomists, greenhouse and nursery managers, and plant research specialists, face in their respective careers.

Teachers are provided detailed professional development to facilitate instruction. Every lesson is aligned with national standards for agriculture, science, mathematics, and English language arts

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

\*This course fulfills the requirement for a third science course graduation requirement

### **0134 Agricultural Experience Program**

The Supervised Agricultural Experience program is a hands-on, student planned way for them to apply skills learned in the classroom to real world agricultural experiences. With help from their agricultural teachers, students develop an SAE project based on one or more SAE categories: **Entrepreneurship, Placement, Research and Experimentation** and **Exploratory**.

## ***CASE Plant Science Specialization: Choose One***

### **0164 CASE Animal and Plant Biotechnology\***

*Animal and Plant Biotechnology*, a specialization course in the CASE Program of Study, provides students with experiences in industry appropriate applications of biotechnology related to plant and animal agriculture. Students will complete hands-on activities, projects, and problems designed to build content knowledge and technical skills in the field of biotechnology.

Students are expected to become proficient at biotechnological skills involving micropipetting, bacterial cultures and transformations, electrophoresis, and polymerase chain reaction.

Students will maintain a research level Laboratory Notebook throughout the course documenting their experiences in the laboratory. Research and experimental design will be highlighted as students develop and conduct industry appropriate investigations.

Students will develop and conduct a research project following the National FFA Agriscience Fair guidelines. From background research through data collection and analysis, students will investigate a problem of their choice and conclude the project by reporting their results in the forms of a research paper and a research poster.

CASE resources and professional development provide extensive preparation for the teacher to be proficient and confident in their ability to provide proper instruction of biotechnology skills and concepts.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

\*This course fulfills the requirement for a third science course graduation requirement

### **0165 CASE Food Science and Safety**

*Food Science and Safety* is a specialization course in the CASE Program of Study. Students will complete hands-on activities, projects, and problems that simulate actual concepts and situations found in the food science and safety industry, allowing students to build content knowledge and technical skills. Students will investigate areas of food science including food safety, food chemistry, food processing, food product development, and marketing.

Students will maintain a research level Laboratory Notebook throughout the course documenting their experiences in the laboratory. Research and experimental design will be highlighted as students develop and conduct industry appropriate investigations.

In addition, students will explore connections between the *Food Science and Safety* lessons, Supervised Agricultural Experience, and FFA components that are important for the

development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0163 CASE Agriculture Business, Research and Development**

*Agricultural Research and Development* is the capstone course designed to culminate students' experiences in agriculture, based on the pathway of study they pursued.

Woven throughout the course are projects and problems based in practical applications and designed to develop and improve employability skills of students. Students will further enhance critical thinking and teamwork skills as they expand on content knowledge from previous CASE courses.

## Power, Structural and Technical Systems Pathway

### Pathway Description:

The Power, Structural and Technical Systems pathway focuses on entrepreneurial and technical skills and careers in the agricultural mechanics industry.

**Program of Study:** AG0110 Power, Structural and Technical Systems

**Courses:** 0101 Introduction to Agriculture, Food, and Natural Resources  
or CASE Introduction to Agriculture, Food, and Natural Resources  
0112 Fundamentals of Agriculture Mechanics  
0134 Agricultural Experience Program  
Power, Structural & Technical Specialization

### Program of Study Description:

The Power, Structural and Technical Systems Program of Study focuses on entrepreneurial and technical skills and careers in the agricultural mechanics industry. Specializations for this Program of Study allow students to pursue their interests in either agricultural structures or agriculture repair and maintenance.

### Course Descriptions:

#### **0101 Introduction to Agriculture, Food, and Natural Resources**

This is a core course for the Agriculture, Food and Natural Resources Career Cluster that builds a knowledge base and technical skills in all aspects of the industry. Learners will be exposed to a broad range of agriculture, food and natural resources careers. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

#### **0161 CASE Introduction to Agriculture, Food and Natural Resources**

*Introduction to Agriculture, Food, and Natural Resources (AFNR)* introduces students to the range of agricultural opportunities and the pathways of study they may pursue. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE™ curriculum.

Woven throughout the course are activities to develop and improve employability skills of students through practical applications. Students will explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course will experience hands-on activities, projects, and problems. Student experiences will involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students will learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students will work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, Food, and Natural Resources* course is intended to serve as the introductory course within the CASE Program of Study. The course is structured to enable all students to have a variety of experiences that will provide an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students will investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0112 Fundamentals of Agriculture Mechanics**

This course introduces the knowledge and skills for applying the physical science principles and principles of operation and maintenance to mechanical equipment, welding and fabrication, structures, plumbing, electrical wiring, power utilization, and entrepreneurship. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0134 Agricultural Experience Program**

The Supervised Agricultural Experience program is a hands-on, student planned way for them to apply skills learned in the classroom to real world agricultural experiences. With help from their agricultural teachers, students develop an SAE project based on one or more SAE categories: **Entrepreneurship, Placement, Research and Experimentation** and **Exploratory**.

***Power, Structural & Technical Specialization: Choose One***



**0113 Agriculture Structures**

Students will use computer skills to develop simple sketches and plans, read and relate structural plans to specifications and building codes, estimate project costs, use construction/fabrication equipment and tools, and plan and design machinery, equipment, buildings and facilities. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

**0114 Agriculture Equipment and Repair**

This course builds on the principles of the previous course and provides more in-depth knowledge and skills as they relate to energy sources, lubricants, service and maintenance of machinery and equipment, and equipment operation. Students will apply principles of service and repair by troubleshooting problems and evaluating engine performance, follow guidelines to service and repair power transmission systems, hydraulic systems, and entrepreneurship. Tools used with these procedures will allow students to demonstrate proper skills and safety. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

## Agriculture, Food and Natural Resources Cluster Electives

### *Agribusiness Systems Pathway*

**Program of Study:** AG0120 Agribusiness Systems

WVEIS CODE	Courses
0133	Agricultural Cooperative Education
0146	Leadership Development
0184	Timber Management
0201	Grounds Maintenance
2007	Equine Science
0520	Work-Based Integration and Transition

#### **0133 Agricultural Cooperative Education**

Students enrolled in agricultural education courses have the unique opportunity for experiential and contextual learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course is designed for seniors in agricultural education classes who are in their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. Safety instruction is integrated into all activities. This course will give students experience in a potential agricultural career. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

#### **0146 Leadership Development**

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

### **0184 Timber Management**

This course is an advanced course in the Forest Industry Program of Study. The course will allow students to cover the topics of timber management, measurement and evaluation and logging practices in depth utilizing problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0201 Grounds Maintenance**

This course is designed to provide students with basic knowledge, skills and attitudes necessary for successful entry into a grounds maintenance occupation. Major instructional concepts included in this area of study are: safety principles in grounds maintenance, grounds maintenance equipment identification and use, career opportunities in grounds maintenance, lawn and landscape improvement and maintenance, and plant and soil science. Safety instruction is integrated into all activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

### **2007 Equine Science**

This specialization course focuses on the basic scientific principles and processes related equine physiology, breeding, nutrition, and management practices involved in the equine industry. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.

## Agriculture, Food and Natural Resources Cluster Electives

### *Animal Systems Pathway*

**Program of Study:** AG0220 Animal Systems

WVEIS CODE	Courses
0133	Agricultural Cooperative Education
0146	Leadership Development
0520	Work-Based Integration and Transition

#### **0133 Agricultural Cooperative Education**

Students enrolled in agricultural education courses have the unique opportunity for experiential and contextual learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course is designed for seniors in agricultural education classes who are in their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. Safety instruction is integrated into all activities. This course will give students experience in a potential agricultural career. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

#### **0146 Leadership Development**

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

#### **0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and

to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.

**Program of Study:** AG0221 CASE Animal Science

WVEIS CODE	Courses
0520	Work-Based Integration and Transition

**0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.

**Program of Study:** AG0223 Pet Grooming

WVEIS CODE	Courses
0520	Work-Based Integration and Transition

**0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research,

attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.

**Agriculture, Food and Natural Resources Cluster Electives**  
***Food Products and Processing Pathway***

**Program of Study:** AG0230 Animal Processing

WVEIS CODE	Courses
0133	Agricultural Cooperative Education
0146	Leadership Development
0520	Work-Based Integration and Transition

**0133 Agricultural Cooperative Education**

Students enrolled in agricultural education courses have the unique opportunity for experiential and contextual learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course is designed for seniors in agricultural education classes who are in their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. Safety instruction is integrated into all activities. This course will give students experience in a potential agricultural career. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

**0146 Leadership Development**

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

**0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and

to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.



**Agriculture, Food and Natural Resources Cluster Electives**

***Natural Resources Systems Pathway***

**Program of Study:** AG2185 Chemical, Energy and Mechanical Technologies

WVEIS CODE	Courses
0520	Work-Based Integration and Transition

**Elective Course Descriptions:**

**0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.

**Program of Study:** AG0130 Forest Industry

WVEIS CODE	Courses
0520	Work-Based Integration and Transition

**Elective Course Descriptions:**

**0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.

Program of Study: **AG0170 Natural Resources Management**

WVEIS CODE	Courses
0133	Agricultural Cooperative Education
0146	Leadership Development
0184	Timber Management
0520	Work-Based Integration and Transition

**0133 Agricultural Cooperative Education**

Students enrolled in agricultural education courses have the unique opportunity for experiential and contextual learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course is designed for seniors in agricultural education classes who are in their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. Safety instruction is integrated into all activities. This course will give students experience in a potential agricultural career. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

**0146 Leadership Development**

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

**0184 Timber Management**

This course is an advanced course in the Forest Industry Program of Study. The course will allow students to cover the topics of timber management, measurement and evaluation and logging practices in depth utilizing problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active

members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools, and skill sets.

### **0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.

## Agriculture, Food and Natural Resources Cluster Electives

### *Plant Systems Pathway*

**Program of Study:** AG0210 Plant Systems

WVEIS CODE	Courses
0133	Agricultural Cooperative Education
0146	Leadership Development
0201	Grounds Maintenance
0520	Work-Based Integration and Transition

#### **0133 Agricultural Cooperative Education**

Students enrolled in agricultural education courses have the unique opportunity for experiential and contextual learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course is designed for seniors in agricultural education classes who are in their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. Safety instruction is integrated into all activities. This course will give students experience in a potential agricultural career. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

#### **0146 Leadership Development**

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

#### **0201 Grounds Maintenance**

This course is designed to provide students with basic knowledge, skills and attitudes necessary for successful entry into a grounds maintenance occupation. Major instructional concepts

included in this area of study are: safety principles in grounds maintenance, grounds maintenance equipment identification and use, career opportunities in grounds maintenance, lawn and landscape improvement and maintenance, and plant and soil science. Safety instruction is integrated into all activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

### **0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.

## Agriculture, Food and Natural Resources Cluster Electives

### *Power, Structural and Technical Systems Pathway*

**Program of Study:** AG0110 Power, Structural and Technical Systems

WVEIS CODE	Courses
0133	Agricultural Cooperative Education
0146	Leadership Development
2002	Agriculture Small Engine Repair
2004	Agriculture Blueprint/CAD
2006	Agriculture Intro. To Oxy-Acetylene/Arc Welding
0520	Work-Based Integration and Transition

#### **0133 Agricultural Cooperative Education**

Students enrolled in agricultural education courses have the unique opportunity for experiential and contextual learning on a grand scale. Students may select and participate in appropriate agricultural enterprises which provide opportunity to acquire skills, earn money and develop responsibility while also earning high school credit. This course is designed for seniors in agricultural education classes who are in their third or fourth year with satisfactory grades. Students will be placed in an agricultural occupation and will receive wages, credits toward graduation and school-release time of a maximum of three hours per day. Students who wish to enroll will need approval from program coordinator. An attendance contract will be required. The contract will be signed by the student, parent/guardian, administrator and program coordinator. Safety instruction is integrated into all activities. This course will give students experience in a potential agricultural career. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

#### **0146 Leadership Development**

This course is designed to provide students with basic leadership skills. Instructional areas include leadership styles, goal setting, time management, public speaking, job skills and interpersonal relationships. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

### **2002 Agriculture Small Engine Repair**

This course is an elective course in the Agriculture, Food and Natural Resources cluster. The skill sets focused in this course to develop a students' knowledge and abilities in the theory of operation, maintenance, troubleshooting and repair of small gasoline engines. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

### **2004 Agriculture Blueprint/Cad**

This course is an elective course in the Agriculture, Food and Natural Resources cluster. The skill sets focused in this course to develop a students' knowledge and abilities to read and interpret blueprints and make mechanical drawings. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

### **2006 Agriculture Intro to Oxy-Acetylene/Arc Welding**

This course is an elective course in the Agriculture, Food and Natural Resources cluster. The skill sets focused in this course to develop a student's knowledge and abilities in SMAW and MIG Welding, Oxy Fuel Cutting, Welding and Brazing. Safety instruction is integrated into relevant activities. Teachers should provide each student with real world learning opportunities and instruction related to selection, development, and maintenance of individual Supervised Agricultural Experience (SAE) programs. Students are encouraged to become active members of FFA, the national youth organization for those enrolled in agricultural education. FFA is an integral component of the program and provides curricular opportunities that enhance student achievement. Teachers should utilize relevant FFA activities to support experiential learning.

### **0520 Work-Based Integration and Transition**

This course gives students the opportunity to integrate theory and practice by interacting with industry professionals. Students will study various requirements for employability including ethics, communication, teamwork and professionalism. Students will participate in hands-on, digital or work-based experiences related to industry settings in order to practice skill sets and to transition from student to employee. A supervised project will be developed in one or more of the following categories: Entrepreneurship (ownership or operation of a business); Placement (employment or internship); Research and Experimentation (planning and/or

conducting a scientific experiment); Exploration (exploration of related careers through activities such as shadowing employees in various work settings, conducting on-line research, attending professional development activities, etc.). Students will develop materials to supplement their Simulated Workplace portfolios.



## Middle School Career Technical Education Courses

### Course Descriptions:

#### **0290 Exploration in Agriculture**

This course is designed as an exploratory course to develop student understanding and skills in the nature of agriculture, food and natural resources. Students utilize problem-solving techniques and participate in hands-on activities to develop an understanding of course concepts. Teachers should provide each student with real world learning opportunities and instruction. Students are encouraged to become active members of the student organization, FFA. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and skill sets.