

# AGRISCIENCE

Note: All Agriscience courses will qualify as Science credit for graduation requirements.

Course Name	9	10	11	12
Exploring Agriscience ES	E	E	E	E
Food Science ES	E	E	E	E
Natural Resource Science ES	E	E	E	E
Plant Science ES	E	E	E	E
Animal Science ES		E	E	E
Natural Resource Science 2 ES		E	E	E
Food Science 2 ES		E	E	E
Biotechnology ES		E	E	E
Animal Science 2: Clinical Procedures ES		E	E	E
Agriscience TA		E	E	E
Agriscience Research Independent Study ES		E	E	E
Comparative Anatomy ES *			E	E
Biotechnology 2: Advanced Biotechnology Concepts ES *			E	E
AP Environmental Science ES *			E	E
Advanced Plant Science ES		E	E	E
Youth Apprenticeship			E	E
E = Elective Course      R= Required Course      * = Honors Course				

## Exploring Agriscience ES

*0.5 Credit: Semester*

*Prerequisite: None*

Exploring Agriscience is an introductory level course geared for freshmen and sophomores to give a taste of each area of Agriscience so students can decide what pathways they enjoy and want to pursue further. Students will spend time working in the greenhouse and atrium, designing their own experiments, determining heart rates, evaluating an animal's physical characteristics, cloning plant tissue, designing a food science lab, exploring water quality issues and our natural resources, basic FFA concepts and opportunities will be explored and so much more. You will discover how science is applied throughout our everyday life and the career areas that stem from these experiences.

## Food Science ES

*0.5 Credit: Semester*

*Prerequisite: None*

This course is designed to introduce students to the world of food science in our ever-changing world. Students will gain an understanding of chemical additives in food, and how water, carbs, lipids and proteins work within food. Student learning will focus on 20+ lab experiences with modern processes and procedures. This course offers an exploration in a field where salaries are competitive and graduates with this knowledge are in demand.

## Natural Resource Science ES

*0.5 Credit: Semester*

*Prerequisite: None*

If the smell of fresh air and being outdoors is something you treasure, then Natural Resource Science may be for you. Students explore national and state parks, learn about the forest industry, measure tree height, and diameter, conduct water quality tests on our aquaculture operation, weigh and measure fish, design a climate research study or complete a taxidermy project, utilize and demonstrate proper compass use, and explore career areas in natural resources. Hands-on activities and simulations are conducted throughout the course along with designing summative labs.

## **Plant Science ES**

*0.5 Credit: Semester*

*Prerequisite: None*

In this course, students are in charge of the greenhouse and hydroponics (growing plants in a liquid medium) projects. Experiences offered include plant production through a variety of methods, plant care and maintenance, soil tests, insect identification, landscape design project, and be assigned a section of the greenhouse to maintain. Students will also work in the atrium by pruning trees and other plant material, planting flowers and adding accent areas, and testing fertilizer and water levels. If you want to be up and about doing activities—this is the course that will fit you. Roughly half of the class time is in the greenhouse.

## **Animal Science ES**

*0.5 Credit: Semester*

*Prerequisite: Exploring Agriscience OR Sophomore Status and/or consent of instructor*

Animal Science is the foundation course for students who like to work with and care for animals. This course develops an understanding that animal work is also a business. Students learn about evaluation, nutrition, health care, basic animal anatomy/physiology, and management. This course covers large animals including cattle, horses, sheep, and swine, as well as small animals and pets. Anatomy and physiology labs are the highlights of the course. A portion of the class is spent in the animal lab.

## **Natural Resource Science 2 ES**

*0.5 Credit: Semester*

*Prerequisite: Natural Resource Science*

This course will look into sustainable conservation management practices. Students will explore natural resource industries and career opportunities, research and make alternative energy sources like biodiesel, analyze and maintain a polyculture system (growth of plants using existing fish aquaculture system), and explore the sustainability of our nation's natural resources. Hands-on activities and simulations are conducted throughout this course.

## **Food Science 2 ES**

*0.5 Credit: Semester*

*Prerequisite: Food Science*

Food processing is the largest industry in the United States. As the industry tries to meet consumer demands, more highly knowledgeable and competently trained food technologists are needed. Students will expand their fundamentals of food science and underlying technology associated with providing a safe, nutritious, and abundant supply of fresh and processed foods. Students will be introduced to concepts on food safety and explore preservative techniques. Students will use the scientific method to test their own experimental designs

## **Biotechnology (Genetics and Microbiology) ES**

*1 Credit: Yearlong*

*Prerequisite: Grade of C or better in Biology OR Consent of Instructor*

This course is designed to introduce students to the biotechnology revolution. Students will gain an understanding of genetic engineering, animal and plant tissue cultures, electrophoresis, related biotechnology careers and biotechnology's relationship to bacteria and the environment. In addition, students will explore immunology, reproductive biotechnology, and biotechnology ethics. Learning will focus on hands-on activities with many labs every unit including the modern implementation of polymerase chain reactions and protein purification. This course is designed for students who wish to broaden their science background with experience in "real life" situations. This course is extremely helpful if wanting to take the AP Biology Exam

## **Animal Science 2: Clinical Procedures ES**

*0.5 Credit: Semester*

*Prerequisite: Animal Science*

This course is designed for the animal lover that might pursue a career working with animals. This course will be highly lab-oriented with many hands-on application skills developed. Students will experience animal handling and restraint, animal drug use and safety, conduct an animal physical, learn bandage and oral health techniques, parasitology identification, basic diagnosis, animal behavior, techniques to develop client relations and animal science career exploration.

### **Agriscience Research Independent Study ES**

*0.5 Credit: Semester*

*Prerequisite: Consent of instructor*

Junior/Senior level students preferred with vast Agriscience coursework are eligible for this opportunity. Underclassmen may apply if an Agriscience research topic is clearly defined. Students will develop leadership programs within the FFA program, design community service projects and compete in various high-level Agriscience award program areas. To pass the independent study, students must defend their research findings to a panel approved by the Agriscience instructor(s), like FFA Agriscience fair judges or BFHS school board.

### **Comparative Anatomy ES – Honors**

*1 Credit: Yearlong*

*Prerequisite: Animal Science 2 or Senior Status*

This course is designed for students who have a love of animals and/or are interested in becoming a veterinarian, veterinarian technician, nurse, physical therapist, or another medical professional. Nine body systems will be experienced in detail. Activities will include dissection of fetal pigs to hearts and tracheas to kidneys. Examples of labs will include urinalysis, blood draws and plasma separation, EKG and blood pressure, cancer morphology, etc. This course will enhance current scientific knowledge and apply it to situations found in the worlds of veterinary science and medicine. This course is extremely helpful if wanting to take the AP Biology Exam.

### **Biotechnology 2 ES – Honors**

*1 Credit: Yearlong*

*Prerequisite: Grade of C or better in Biotechnology 1 OR Consent of instructor*

This advanced course will offer students an opportunity to expand their laboratory skill set in the field of biotechnology. Students will gain skills in DNA typing, challenging DNA restriction analysis additional practice in polymerase chain reaction procedures, using Ti plasmids to genetically alter plants, animal cell culture techniques, and the use of bioinformatics. Students wanting to continue this course pathway may then conclude with a biotechnology research project to conduct their own research to then compete in state and national level science and Agriscience fairs.

### **AP Environmental Science ES – Honors**

*1 Credit: Yearlong*

*Prerequisite: Junior Status*

This is a rigorous, lab-based environmental course for students with an interest in our natural world. AP Environmental Science will cover the interrelationships of the natural world as outlined in the AP Environmental Science course description from The College Board. Environmental problems and alternative solutions for resolving and/or preventing them will be examined. Advanced Placement Environmental Science is an interdisciplinary experience; it embraces a wide variety of topics from different areas of study. Students are expected to take the AP exam in May. Two major summative labs will be designed and conducted.

### **Advanced Plant Science ES**

*0.5 Credit: Semester*

*Prerequisite: Plant Science*

In Advanced Plant Science, students will continue their skill development in plant care and management. More focus will be given to landscape design and sustainable agronomy. Students will also take their abilities to a higher level by managing the greenhouse production. The majority of this course will be hands-on lab activities. Students will also help supervise the atrium care and management. A large component of this course is a student-designed research project.