



# Ag Biotechnology

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18308
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0
Graduation Requirement	N
Program of Study and Sequence	Pathway course in Animal Systems, Food Product and Processing Systems, Plant Systems, or Natural Resources and Environmental Science Systems – <b>Ag Biotechnology</b> – Capstone Experience
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurship, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	
Teacher Certification	Agriculture Education
Resources	

## Course Description:

Our lives are increasingly touched by technological advances in biology from discoveries in disease and pest control to reproductive capabilities in plants and animals as well as biological benefits in environmental sciences. Agricultural biotechnology will experience a large growth rate in the next five years particularly in the areas of crop and livestock genetic engineering. Biotechnology in Agriculture is designed to provide students with basic lab skills and skills in biotechnology applications in plant and animal sciences. Utilizing appropriate equipment and technology may enhance classroom and laboratory content; mathematics, English, biology, and human relations skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises and field trips. Opportunities for application of clinical and leadership skills are provided by participation in FFA through activities, conferences and skills competition such as science-related Career Development Events and Proficiency awards. Each student will be expected to maintain a Supervised Agricultural Experience Program (SAE).

## Program of Study Application

Ag Biotechnology is an upper level pathway course in the Animal Systems, Food Product and Processing Systems, Plant Systems, and Natural Resources and Environmental Science Systems pathways in the Agriculture, Food and Natural Resources Cluster. Ag Biotechnology would follow a cluster course in any of those pathways, and would precede a capstone experience.

**Course Standards**

**AB 1 Assess factors that have influenced the evolution of biotechnology in agriculture. [National AFNR BS.01.]**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Strategic Thinking	AB 1.1 Investigate and explain the relationships among past, current and emerging applications of biotechnology in agriculture.	
Three Strategic Thinking	AB 1.2 Evaluate the scope and implications of regulatory agencies on applications of biotechnology in agriculture and protection of public interests.	
Four Extended Thinking	AB 1.3 Analyze the relationships and implications of bioethics, laws and public perceptions on applications of biotechnology in agriculture.	

**Notes**

**AB 2 Illustrate the functions and importance of biotechnology at the cellular level.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Recall	AB 2.1 Recognize components of cells and their application to genetic improvement.	
One Recall	AB 2.2 Illustrate the role of cell structures in genetic theory.	

**Notes**

**AB 3 Safely apply appropriate skills to complete tasks in a biotechnology research and development environment.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	AB 3.1 Read, document, evaluate and secure accurate laboratory records of experimental protocols, observations and results.	
Three Strategic Thinking	AB 3.2 Implement standard operating procedures (SOP) for the biotechnology sector.	

**Notes**

**AB 4 Analyze the application of biotechnology to solve problems in Agriculture, Food and Natural Resources (AFNR) systems. National AFNR BS.03**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Strategic Thinking	AB 4.1 Investigate biotechnology principles, techniques and processes to enhance plant systems.	
Three Strategic Thinking	AB 4.2 Investigate biotechnology principles, techniques and processes to enhance animal systems.	
Three Strategic Thinking	AB 4.3 Investigate biotechnology principles, techniques and processes to enhance food products and processing systems.	
Three Strategic Thinking	AB 4.4 Investigate biotechnology principles, techniques and processes to enhance natural resources and environmental service systems.	

**Notes**

Career Cluster: AFNR

Course: Ag Biotechnology

**AB 5 Develop employability skills related to the Animal, Food Product and Processing, Plant, and Natural Resources and Environmental Science Systems.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	AB 5.1 Develop soft skills to enhance employability.	

**Notes**