CareerClusters™ PATHWAYS TO COLLEGE & CAREER READINESS
Agriculture, Food & Natural Resources

State Approved Courses for Agriculture, Food & Natural Resources Programs

Foundational CTE Courses

Career Exploration (22151^) Employability (22152^) Entrepreneurship (12053^) Foundations of Technology (10004^) Leadership & Service (22101^)

Cluster Courses

MS Introduction to AFNR (18000) Introduction to AFNR (18001^) CASE Introduction to AFNR (18006)
Ag Leadership & Communications (18203^) Independent Supervised Agriculture Experience – SAE (#)

Pathway Courses

Food Products & Processing Systems Pathway	***Plant Systems***	***Animal Systems Pathway***	***Power, Structural & Technical Systems Pathway***	***Natural Resources Systems Pathway***	***Environmental Service Systems Pathway***	***Agribusiness Systems Pathway***
Ag Processing Technology (18302) Food Science (18305) Agriculture Biotechnology (18308)	Fundamental Plant Science (18051) Fundamental Horticulture (18052) Horticulture Operations (18053) Advanced Plant Science (18057) Agriculture Biotechnology (18308)	Fundamental Animal Science (18101^) Companion Animals (18102^) Advanced Animal Science (18107^) Agriculture Biotechnology (18308)	Fundamental Ag Mechanical Technologies (18401^) Ag Systems Technology (18402) Fundamental Ag Structures Technology (18403) Ag Metal Fabrication (18404) Advanced Ag Structures Technology (18407)	Wildlife & Fisheries (18501^) Fundamental Natural Resources (18504^) Advanced Natural Resources (18502)	Issues in Environmental Science (03003^) Fundamental Natural Resources (18504^) Advanced Natural Resources (18502) Agriculture Biotechnology (18308)	Agribusiness Sales & Marketing (18201) Agribusiness Management (18202^)

Curriculum for Agricultural Science Education (CASE) Courses

CASE Food Science & Safety (18312)	CASE Principles of Agricultural Science – Plant (18056) CASE Animal & Plant Biotechnology (18313)	CASE Principles of Agricultural Science – Animal (18106) CASE Animal & Plant Biotechnology (18313)	CASE Agricultural Power & Technology (18405) CASE Mechanical Systems in Agriculture (18449)	CASE Natural Resources & Ecology (18505)	CASE Environmental Science Issues (18507)	CASE Ag Research & Development (18204

Dual Credit Courses

Visit https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf for a full list of dual credit courses in the Agriculture, Food & Natural Resources Career Cluster.

Academic CTE Courses

Biology (03051^) Biology - Advanced Studies (03052) AP Biology (03056^) Chemistry (03101^) Organic Chemistry (03103)
AP Chemistry (03106^) AP Environmental Science (03207) Physics (03151^) Geometry (02072^)

Capstone CTE Courses

Entrepreneurship Experience (80026) Senior Experience (80019^) Youth Apprenticeship (80020) Service Learning (22104) Youth Internships (80018^)

^Denotes course is available on the SD Virtual School (http://www.sdvs.k12.sd.us/)

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Advanced Ag Structures

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18407
Prerequisite(s)	Fundamental Ag Structures Technology, Recommended: Introduction to AFNR
Credit	0.5 credit
Program of Study and Sequence	Fundamental Ag Structures Technology – Advanced Ag Structures Technology – Capstone Experience
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Agricultural, Construction Industry, or General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture, Food, and Natural Resources Cluster Endorsement; Power Structural & Technical Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description
Advanced Ag Structures Technology is offered to meet more advanced needs in the agricultural structures industry, along with soft skills necessary for careers in the Agriculture, Food and Natural Resources sector. South Dakota continues to face a shortage of certified electricians, plumbers, contractors, and mechanics, leaving these careers in high demand. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, geometry, trigonometry, English, and human relations skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises, industry speakers, job shadowing and field trips. This class is reinforced through the FFA and Supervised Agricultural Experience (SAE) programs, the Ag Mechanics Career Development Event, and related Proficiency Experience or Internship Project. Each student will be expected to maintain an SAE.

Program of Study Application
Advanced Ag Structures Technology is the second pathway course in the Agriculture, Food and Natural Resources Program of Study, Power Systems pathway. Fundamental Ag Structures Technology is a prerequisite for Advanced Ag Structures Technology. Advanced Ag Structures Technology would be followed by a capstone experience.

Course Standards

AdS 1: Use safe practices when planning, maintaining, and constructing agricultural structures.

Webb Level	*Sub-indicator*
Two Skill/Concept	AdS 1.1 Demonstrate safe use and knowledge of tools and equipment while constructing agricultural structures.
Three Strategic Thinking	AdS 1.2 Demonstrate understanding of tool repair and maintenance.
Three Strategic Thinking	AdS 1.3 Demonstrate workplace/worksite safety procedures and protocols.

AdS 2: Service and repair mechanical equipment and structures.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AdS 2. 1 Analyze schematics to service various systems in an ag structure.

AdS 3: Utilize a structural plan that meets specifications and building codes.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AdS 3.1 Examine blueprints and local codes that identify required components of an ag structure.
Three Strategic Thinking	AdS 3.2 Design a construction plan for an agricultural structure.

AdS 4: Use plans to guide construction of agricultural structures.

Webb Level	*Sub-indicator*
Four Extended Thinking	AdS 4.1 Use architectural and mechanical plans to construct agricultural buildings or facilities.

AdS 5: Apply a variety of concrete and masonry concepts to various projects.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AdS 5.1 Demonstrate concrete and masonry procedures.

AdS 6: Investigate a variety of plumbing tools and products.

Webb Level	*Sub-indicator*
One Recall	AdS 6.1 Identify tools and materials used for plumbing.
Three Strategic Thinking	AdS 6.2 Demonstrate various plumbing techniques.

AdS 7: Develop employability skills related to the Power, Structural, and Technical Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	AdS 7.1 Develop soft skills to enhance employability.

AdS 8: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AdS 8.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AdS 8.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AdS 8.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AdS 8.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AdS 8.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Advanced Animal Science

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18107
Prerequisite(s)	Recommended: Intro to AFNR, Fundamental Animal Science
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Fundamental Animal Science – Advanced Animal Science – Ag Biotechnology – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Agricultural or General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture, Food and Natural Resources Cluster Endorsement; Animal Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description

Advanced Animal Science will address the advanced knowledge and skills necessary to care for and meet the needs of animals, along with soft skills necessary for careers in the Agriculture, Food and Natural Resources sector. Topics covered include: animal health care practices, nutrition management, reproductive practices, medical terminology, animal classification, surgical techniques, and employability skills. Advanced Animal Science has an increased focus on the veterinary portion of animal husbandry. Utilizing appropriate equipment and technology should enhance classroom and laboratory content. Algebra, 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. This class is reinforced through the FFA and Supervised Agricultural Experience (SAE) activities such as the Livestock Evaluation Career Development Event and related Proficiency Awards. Each student will be expected to maintain a SAE.

Program of Study Application

Advanced Animal Science is the second pathway course in the Agriculture, Food and Natural Resources Program of Study, Animal Systems pathway. Advanced Animal Science is preceded by Fundamental Animal Science and is recommended to be taken prior to participation in Ag Biotechnology.

Course Standards

ADAn 1: Understand and use safe practices.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADAn 1.1 Demonstrate safe use and knowledge of tools and equipment used in animal science.
Two Skill/Concept	ADAn 1.2 Demonstrate workplace/worksite safety procedures and protocols.

ADAn 2: Select proper health care practices for animals.

Webb Level	*Sub-indicator*
Four Extended Thinking	ADAn 2.1 Choose prevention and treatment programs for animal diseases, parasites, and disorders.
Two Skill/Concept	ADAn 2.2 Discuss how to provide biosecurity for animals, people, and facilities.

ADAn 3: Develop proper nutrition management practices to optimize animal performance.

Webb Level	*Sub-indicator*
Three Strategic Thinking	ADAn 3.1 Assess nutritional elements as they affect animal performances.
Three Strategic Thinking	ADAn 3.2 Develop feed rations to provide for animals' nutritional needs.

ADAn 4: Select reproductive practices to optimize animal production.

Webb Level	*Sub-indicator*
Four Extended Thinking	ADAn 4.1 Identify management practices in breeding that account for high quality animals.

ADAn 5: Articulate medical terminology as it relates to animals.

Webb Level	*Sub-indicator*
One Recall	ADAn 5.1 Recognize relevant medical terminology related to animals.
Two Skill/Concept	ADAn 5.2 Apply medical terminology in the correct context.

ADAn 6: Classify, evaluate, and select animals based on anatomical and physiological characteristics.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADAn 6.1 Apply principles of anatomy and physiology to uses within various animal systems.
Four Extended Thinking	ADAn 6.2 Analyze information and make connections pertaining to the interrelatedness of various body systems.

ADAn 7: Utilize principles of veterinary tools and techniques.

Webb Level	*Sub-indicator*
One Recall	AdAn 7.1 Identify veterinary tools and practices.
Four Extended Thinking	ADAn 7.2 Apply proper veterinary techniques to medical situations.

ADAn 8: Develop employability skills related to the Animal Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADAn 8.1 Develop soft skills to enhance employability.

ADAn 9: Develop employability skills related to the Animal Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADAn 9.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	ADAn 9.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	ADAn 9.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	ADAn 9.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	ADAn 9.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Advanced Natural Resources

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18502
Prerequisite(s)	Fundamental Natural Resources, Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Fundamental Natural Resources – Advanced Natural Resources – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Natural Resources & Environmental Science Pathway Endorsement; *Agriculture Education
Resources	

Course Description
Advanced Natural Resources is designed to build upon the basic concepts learned in the Fundamental Natural Resources course. Advanced Natural Resources gives the student a deeper understanding of the decision-making processes that are involved in environmental and natural resource management and conservation, globally, regionally, and locally. Students will specifically examine issues related to natural resource use in South Dakota. Topics will include management strategies such as assessing rangeland condition, examining forest site indices, looking at the health of fisheries and wildlife and applying ecological concepts and principles to living organisms in natural resource systems, as related to sustained yield concepts. Students will be expected to understand the importance of soils and their relationship to all ecosystems. Students will be trained to assess air and water quality standards and parameters. Energy and mineral extraction industries will be examined along with looking at determining impacts on the soil, air, and water resources. Classroom and laboratory content may be enhanced by utilizing up-to-date equipment and technology, such as Geographic Information System software to map and inventory resources in real time. Biology, statistics, algebra, English, and human relation skills will be reinforced throughout the course. Opportunities for application of clinical and leadership skills are provided by participation in FFA activities, conferences, and skills competitions such as sales related career development events and proficiency awards. Each student will be expected to maintain a Supervised Agricultural Experience Program/Internship.

Program of Study Application
Advanced Natural Resources is a second pathway course in the Agriculture, Food and Natural Resources cluster, Natural Resources and Environmental Science Systems pathway. Advanced Natural Resources would follow Fundamental Natural Resources and would prepare a student to participate in a capstone experience.

Course Standards

ANR 1: Explore soil composition and soil management.

Webb Level	*Sub-indicator*
Two Skill/Concept	ANR 1.1 Investigate soil formations and 12 soil orders classification systems.
Three Strategic Thinking	ANR 1.2 Evaluate the role of soil management strategies and their impact on conservation.
Four Extended Thinking	ANR 1.3 Analyze soils for agricultural and homesite uses.
Four Extended Thinking	ANR 1.4 Analyze existing soil surveys to develop effective management plans.

ANR 2: Apply ecological concepts and principles to rangeland conservation.

Webb Level	*Sub-indicator*
Two Skill/Concept	ANR 2.1 Summarize the interrelationships of rangeland management, the environment, wildlife management, and the livestock industry.
One Recall	ANR 2.2 Discuss practices used to improve rangeland quality.
Four Extended Thinking	ANR 2.3 Analyze the carrying capacity in various rangelands for both wildlife species and domestic livestock.
One Recall	ANR 2.4 Identify plants important to quality rangeland and determine rangeland condition.

ANR 3: Understand forest management practices.

Webb Level	*Sub-indicator*
One Recall	ANR 3.1 Identify trees and classify species.
Four Extended Thinking	ANR 3.2 Discuss forestry management techniques.

ANR 4: Apply ecological concepts and principles to fisheries and wildlife in natural resources.

Webb Level	*Sub-indicator*
Two Skill/Concept	ANR 4.1 Compare and contrast wildlife and wild fish management.
Three Strategic Thinking	ANR 4.2 Differentiate among a variety of management practices used to manage wildlife populations.
Four Extended Thinking	ANR 4.3 Propose and/or execute a plan to enhance fish/wildlife habitats in South Dakota.

ANR 5: Understand air and water use, examine management practices, and develop conservation strategies.

Webb Level	*Sub-indicator*
Three Strategic Thinking	ANR 5.1 Compare and contrast between two governmental roles in regulating air and water quality.
One Recall	ANR 5.2 Define appropriate water conservation measures.
Four Extended Thinking	ANR 5.3 Analyze the way in which water and air management affect the environment and human needs.

ANR 6: Develop plans to ensure sustainable production and processing of natural resources.

Webb Level	*Sub-indicator*
Three Strategic Thinking	ANR 6.1 Explain methods used to sustainably produce, harvest, process and use natural resource products (e.g., forest products, wildlife, minerals, fossil fuels, shale oil, alternative energy, recreation, aquatic species, etc.).
Two Skill/Concept	ANR 6.2 Compare the various production methods of alternative energy sources, both renewable and non-renewable, and their relations to economic, environmental, and social sustainability.
Three Strategic Thinking	ANR 6.3 Evaluate methods used to extract and process minerals for economic, environmental, and social sustainability.

ANR 7: Develop employability skills related to the AFNR Cluster.

Webb Level	*Sub-indicator*
Two Skill/Concept	ANR 7.1: Develop soft skills to enhance employability.

ANR 8: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	ANR 8.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	ANR 8.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	ANR 8.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	ANR 8.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	ANR 8.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Advanced Plant Science

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18057
Prerequisite(s)	Fundamental Plant Science AND/OR Fundamental Horticulture, Recommended: Introduction to AFNR
Credit	0.5 credit
Program of Study and Sequence	Fundamental Plant Science – Advanced Plant Science – Ag Biotechnology – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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), Commercial Pesticide Applicator Certification, Private Pesticide Applicator Certification
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Plant Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description

The plant science industry is a large part of the economic structure in South Dakota, especially crop and forage production. Every corner of South Dakota is involved in the plant science field. In Advanced Plant Science, students develop the necessary knowledge, skills, habits, and attitudes for both entry-level employment and advancement within agronomy and related plant science occupations. Topics include plant anatomy, physiology, and classification, sustainability in agronomic operations, pest management, and employability skills. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, biology, English, and human relations skills will be reinforced in the course. Advanced Plant Science is reinforced through the FFA and Supervised Agricultural Experience (SAE) activities such as the Agronomy Career Development Event and related Proficiency Awards. Each student will be expected to maintain a SAE.

Program of Study Application

Advanced Plant Science is a second pathway course in the Agriculture, Food and Natural Resources Program of Study, Plant Systems pathway. Advanced Plant Science is preceded by Fundamental Plant Science and would be followed by Ag Biotechnology.

Course Standards

ADPS 1: Understand and use safe practices.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADPS 1.1 Demonstrate safe use and knowledge of tools and equipment used in this field.
Two Skill/Concept	ADPS 1.2 Demonstrate workplace/worksite safety procedures and protocols.

ADPS 2: Recognize principles of plant anatomy, classification, and physiology for the production and management of agronomic plants.

Webb Level	*Sub-indicator*
One Recall	ADPS 2.1 Classify plants according to taxonomy, life cycles, and plant use.
Three Strategic Thinking	ADPS 2.2 Investigate various genetically modified plants (GMOs) and their relationship and/or impact on the industry.
Two Skill/Concept	ADPS 2.3 Apply knowledge of seed, fruit, and vegetative parts optimal for plant reproduction.

ADPS 3: Employ the principles and practices of sustainable agriculture in a plant-based operation.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADPS 3.1 Incorporate the fundamentals of plant management and sustainable agriculture.
Three Strategic Thinking	ADPS 3.2 Develop an integrated fertilizer plan for specific plants or crops.
Three Strategic Thinking	ADPS 3.3 Evaluate data to manage range and pastures.
Three Strategic Thinking	ADPS 3.4 Examine growth of a plant to determine when and how a crop should be harvested and stored.
Three Strategic Thinking	ADPS 3.5 Evaluate crop and harvest success for future planning.

ADPS 4: Analyze a pest management system.

Webb Level	*Sub-indicator*
One Recall	ADPS 4.1 Identify primary pests of plants and crops
One Recall	ADPS 4.2 Identify pesticides by formulation and use.
Three Strategic Thinking	ADPS 4.3 Develop integrated pest management strategies to manage pest populations.
One Recall	ADPS 4.4 Understand the safe handling, mixing and application of chemicals.

ADPS 5: Develop employability skills related to the Plant Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADPS 5.1 Develop soft skills to enhance employability.

ADPS 6: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADPS 6.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	ADPS 6.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	ADPS 6.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	ADPS 6.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	ADPS 6.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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AFNR Processing

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18302
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Food Science – AFNR Processing– Ag Biotechnology and/or capstone experience – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Food Products and Processing Pathway Endorsement; *Agriculture Education
Resources	

Course Description

AFNR Processing highlights the raw commodity and its journey to consumer-ready, value-added products. Utilizing appropriate equipment, technology, mathematics, science, and English, may enhance classroom and laboratory content and human relations skills will be reinforced in the course. Example potential topics include, but are not limited to, food processing, non-food processing including value added and byproducts of wood, fiber, and fuel. Work-based learning strategies appropriate for this course are school-based enterprises, field trips and internships. Opportunities for application of clinical and leadership skills are provided by participation in FFA through activities, conferences, and skills competitions such as Career Development Event (CDE), Leadership Development Events and Agriscience Fair Research Projects. Each student will be expected to maintain a Supervised Agricultural Experience (SAE).

Program of Study Application

Ag Processing Technology (Food and Fiber) is a second pathway course in the Agriculture, Food and Natural Resources cluster, Food Product and Processing Systems pathway. Ag Processing Technology (Food and Fiber) would follow Food Science and would prepare a student to participate in Ag Biotechnology or a capstone experience.

Course Standards

AgP 1: Understand and use safe practices

Webb Level	*Sub-indicator*
Two Skill/Concept	ADPS 1.1 Demonstrate safe use and knowledge of tools and equipment used in this area.
Two Skill/Concept	ADPS 1.2 Demonstrate workplace/worksite safety procedures and protocols.

AgP 2: Examine the makeup of the AFNR processing industries.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AgP 2.1 Investigate the evolution of the food and/or non-food processing industry.
Two Skill/Concept	AgP 2.2 Discuss how safety is addressed in the AFNR processing industry.
One Recall	AgP 2.3 Explain how regulatory agencies in AFNR Processing industries work to protect consumers.

AgP 3: Demonstrate operational procedures used in AFNR Processing industries.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgP 3.1 Explain regulatory procedures as they apply to AFNR processing.
Two Skill/Concept	AgP 3.2 Demonstrate worker safety procedures for AFNR processing equipment.
Two Skill/Concept	AgP 3.3 Explore advances in technology associated with AFNR processing

AgP 4: Processes for AFNR product storage, distribution, and consumption/use.

Webb Level	*Sub-indicator*
One Recall	AgP 4.1 Classify processed AFNR products.
Two Skill/Concept	AgP 4.2 Characterize industry harvesting, selection and inspection techniques.
Two Skill/Concept	AgP 4.3 Explain the steps involved with producing various AFNR products.
Four Extended Thinking	AgP 4.4 Process AFNR product safely.

AgP 5: Develop employability skills related to the Food Product and Processing Systems.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgP 5.1 Develop soft skills to enhance employability.

AgP 6: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgP 6.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AgP 6.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AgP 6.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AgP 6.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AgP 6.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Ag Biotechnology

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18308
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Pathway course in Animal Systems, Food Product and Processing Systems, Plant Systems, or Natural Resources and Environmental Science Systems – Ag Biotechnology – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture, Food and Natural Resources Cluster Endorsement; Plant Systems Pathway Endorsement; *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 continue to experience rapid growth in all sectors. 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 competitions such as science-related Career Development Events, Leadership Development Events, Agriscience Fair 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: Understand and use safe practices.

Webb Level	*Sub-indicator*
Two Skill/Concept	AB 1.1 Demonstrate safe use and knowledge of tools and equipment used in this area.
Two Skill/Concept	AB 1.2 Demonstrate workplace/worksite safety procedures and protocols.

AB 2: Assess factors that have influenced the evolution of biotechnology in agriculture. [National AFNR BS.01.]

Webb Level	*Sub-indicator*
Three Strategic Thinking	AB 2.1 Investigate and explain the relationships among past, current, and emerging applications of biotechnology in agriculture.
Three Strategic Thinking	AB 2.2 Evaluate the scope and implications of regulatory agencies on applications of biotechnology in agriculture and protection of public interests.
Four Extended Thinking	AB 2.3 Analyze the relationships and implications of bioethics, laws, and public perceptions on applications of biotechnology in agriculture.

AB 3: Illustrate the functions and importance of biotechnology at the cellular level.

Webb Level	*Sub-indicator*
One Recall	AB 3.1 Recognize components of cells and their application to genetic improvement.
One Recall	AB 3.2 Recognize components of genetic transfer.
One Recall	AB 3.3 Illustrate the role of cell structures in genetic theory.
Two Skill/Concept	AB 3.4 Explain the role of genetics and cell structures in gene expression.

AB 4: Safely apply appropriate skills to complete tasks in a biotechnology research and development environment.

Webb Level	*Sub-indicator*
Two Skill/Concept	AB 4.1 Read, document, evaluate and secure accurate laboratory records of experimental protocols, observations, and results.
Three Strategic Thinking	AB 4.2 Implement standard operating procedures (SOP) for the biotechnology sector.

AB 5: Analyze the application of biotechnology to solve problems in Agriculture, Food and Natural Resources (AFNR) systems.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AB 5.1 Investigate biotechnology principles, techniques, and processes to enhance plant systems.
Three Strategic Thinking	AB 5.2 Investigate biotechnology principles, techniques, and processes to enhance animal systems.
Three Strategic Thinking	AB 5.3 Investigate biotechnology principles, techniques, and processes to enhance food products and processing systems.
Three Strategic Thinking	AB 5.4 Investigate biotechnology principles, techniques, and processes to enhance natural resources and environmental service systems.
Three Strategic Thinking	AB 5.5 Investigate the impact agriculture biotechnology has had on modern medicine

AB 6: Develop employability skills related to the Animal, Food Product and Processing, Plant, and Natural Resources and Environmental Science Systems.

Webb Level	*Sub-indicator*
Two Skill/Concept	AB 6.1 Investigate the impact agriculture biotechnology has had on modern medicine.

AB 7: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AB 7.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AB 7.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AB 7.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AB 7.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AB 7.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Ag Leadership and Communications

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18203
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Foundation Course – Ag Leadership and Communications – Pathway Course – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Agricultural, Construction Industry, or General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; *Agriculture Education
Resources	

Course Description
The world population is expected to increase to 9 billion by 2050. The agricultural industry will need strong leadership to guide us to provide food, fiber and fuel for this growing population. Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems. Agriculture Leadership and Communications will provide students with fundamental skills for success in agricultural careers and team environments. Students will investigate a variety of topics essential to communicating about the industry of agriculture. In addition to improving personal traits and career readiness, areas of study include interviewing, writing with or without using opinion, researching techniques, equipment and technology, and presentation of news and agricultural markets. Opportunities for application of clinical and leadership skills are provided by participation in FFA activities, conferences and skills competitions such as sales related career development events and proficiency awards. Each student will be expected to maintain a Supervised Agricultural Experience Program/Internship. English, Speech, and Human Relations skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises, field trips, and internships.

Program of Study Application
Ag Leadership and Communications is a cluster course in the Agriculture, Food and Natural Resources cluster. Ag Leadership and Communications would be preceded by a foundation course and would prepare a student to take a first-level course in any of the Agriculture, Food and Natural Resources pathways.

Course Standards

ALC 1: Act as a responsible and contributing citizen and employee in the AFNR sector.

Webb Level	*Sub-indicator*
Four Extended Thinking	ALC 1.1 Model personal responsibility in the workplace and community.
Four Extended Thinking	ALC 1.2 Demonstrate soft skills for career success.
Two Skill/Concept	ALC 1.3 Apply appropriate academic and technical skills.

ALC 2: Apply and model teamwork and leadership skills in work groups.

Webb Level	*Sub-indicator*
Four Extended Thinking	ALC 2.1 Employ leadership skills to accomplish a team goal.
Three Strategic Thinking	ALC 2.2 Model proper use of parliamentary procedure.
Two Skill/Concept	ALC 2.3 Exhibit a cooperative spirit when working in a group situation.
Three Strategic Thinking	ALC 2.4 Build consensus to accomplish results while considering inclusion and diversity in the workplace and community.

ALC 3: Model integrity, ethical leadership and effective management.

Webb Level	*Sub-indicator*
Two Skill/Concept	ALC 3.1 Model characteristics of ethical and effective leaders in the workplace and community.
Three Strategic Thinking	ALC 3.2 Implement personal management skills to function effectively and efficiently in the workplace.
Three Strategic Thinking	ALC 3.3 Demonstrate behaviors that contribute to a positive morale and culture in the workplace and community.

ALC 4: Communicate information relevant to agriculture clearly, effectively, and with reason.

Webb Level	*Sub-indicator*
One Recall	ALC 4.1 Demonstrate basic information research skills and techniques.
Three Strategic Thinking	ALC 4.2 Evaluate communication strategies that ensure clarity, logic, purpose, and professionalism in formal or informal settings.
Four Extended Thinking	ALC 4.3 Produce clear, reasoned, and coherent written, verbal, or visual communication for formal or informal settings.

ALC 5: Use technology to enhance productivity.

Webb Level	*Sub-indicator*
Two Skill/Concept	ALC 5.1 Research, select, and use new technologies, tools, and applications to maximize productivity in the workplace and community.
Three Strategic Thinking	ALC 5.2 Utilize technology to advocate for AFNR and/or the FFA.
Four Extended Thinking	ALC 5.3 Evaluate personal and organizational risks of technology use and take actions to prevent or minimize risks in the workplace and community.

ALC 6: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	ALC 6.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	ALC 6.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	ALC 6.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	ALC 6.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	ALC 6.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Ag Metal Fabrication Technology

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18404
Prerequisite(s)	Fundamental Ag Mechanical Technologies, Recommended: Introduction to AFNR
Credit	0.5 credit
Program of Study and Sequence	Fundamental Ag Mechanical Technologies – Ag Metal Fabrication – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Construction Industry, or General Industry), National Career Readiness Certificate (NCRC), Certified Welder (AWS)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Power Structural & Technical Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description

The Ag Metal Fabrication Technology course provides students with advanced metal fabrication skills, which include Shielded Metal Arc Welding (SMAW), Metal Inert Gas (MIG) welding/Gas Metal Arc Welding (GMAW), oxy acetylene fuel welding, brazing and cutting, Gas Tungsten Arc Welding (GTAW)/Tungsten Inert Welding (TIG), and plasma cutting. This course will also incorporate soft skills necessary for careers in the Power, Structural, and Technical Systems career pathway. Classroom and laboratory content will be enhanced by utilizing appropriate equipment and technology. Geometry, physical science, physics, English, and human relations skills will be reinforced throughout this course. Work-based learning strategies appropriate for this course are school-based enterprises, industry speakers, job shadowing and field trips. Opportunities for application of clinical and leadership skills are provided by participation in FFA activities, conferences, and Career Development Events. Each student will be expected to maintain a Supervised Agricultural Experience (SAE).

Program of Study Application

Ag Metal Fabrication is a second pathway course in the Agriculture, Food and Natural Resources Program of Study, Power Systems pathway. Ag Metal Fabrication is preceded by Fundamental Ag Mechanical Technologies and would be followed by a capstone experience.

Course Standards

AMF 1: Apply safety practices in metal fabrication.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AMF 1.1 – Demonstrate safe operation and knowledge of metal fabrication tools and equipment.
Three Strategic Thinking	AMF 1.2 - Demonstrate workplace/worksite safety procedures and protocols.

AMF 2: Demonstrate the basics of metal fabrication.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 2.1 Demonstrate knowledge of metal fabrication techniques and related technologies.
Two Skill/Concept	AMF 2.2 Prepare various metals for welding.
Three Strategic Thinking	AMF 2.3 Create plans for a metal project.
Four Extended Thinking	AMF 2.4 Create a metal fabrication project.

AMF 3: Demonstrate the principles of Shielded Metal Arc Welding (SMAW) and the correct operation of SMAW equipment.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 3.1 Perform Shielded Metal Arc Welding (SMAW) techniques.

AMF 4: Demonstrate the principles of Metal Inert Gas (MIG) welding, also known as Gas Metal Arc Welding (GMAW), and the correct operation of MIG equipment.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 4.1 Perform metal inert gas (MIG) welding techniques.

AMF 5: Understand the correct operation of oxyacetylene equipment.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 5.1 Explore oxyacetylene welding, cutting, and brazing.

AMF 6: Explore advanced welding processes.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 6.1 Investigate and explain principles of advanced welding processes (e.g. Tungsten Inert Gas (TIG) welding, plasma cutting (hand or table))

AMF 7: Develop employability skills related to the Power, Structural, and Technical Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 7.1– Develop soft skills to enhance employability.
Two Skill/Concept	AMF 7.2 - Investigate careers related to metal fabrication.

AMF 8: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 8.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AMF 8.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AMF 8.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AMF 8.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AMF 8.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Ag Systems Technology

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18402
Prerequisite(s)	Fundamental Ag Mechanical Technologies, Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Fundamental Ag Mechanical Technologies – Ag Systems Technology – Capstone Experience
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Agricultural, Construction Industry, or General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Power Structural & Technical Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description
Technically trained employees are needed in many aspects of the agriculture power industry. This course addresses the technical and industrial skills and techniques related to Power, Structural, & Technical Systems within South Dakota, as well as address soft skills needed for careers in this area. Technology in agriculture is ever-changing and this course will address emerging technologies in our industry. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Mathematics, science, English, and human relations skills will be reinforced throughout 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 activities, conferences, and skills competitions such as the Ag Mechanics Career Development Event or related proficiency award areas. Each student will be expected to maintain a Supervised Agricultural Experience (SAE) program.

Program of Study Application
Ag Systems Technology is a second pathway course in the Agriculture, Food and Natural Resources Program of Study, Power Systems pathway. Ag Systems Technology is preceded by Fundamental Ag Mechanical Technologies and would be followed by a capstone experience.

Course Standards

AST 1: Understand and use safe practices.

Webb Level	*Sub-indicator*
Two Skill/Concept	AST 1.1 Demonstrate safe use and knowledge of tools and equipment used in this area.
Two Skill/Concept	AST 1.2 Demonstrate workplace/worksite safety procedures and protocols.

AST 2: Apply engineering principles to mechanical equipment, power utilization and technology.

Webb Level	*Sub-indicator*
Two Skill/Concept	AST 2.1 Compare power generation from various energy sources.
Two Skill/Concept	AST 2.2 Investigate various properties of lubricants needed in ag mechanics.

AST 3: Apply principles of operation and maintenance to mechanical equipment, power utilization, and technology.

Webb Level	*Sub-indicator*
Two Skill/Concept	AST 3.1 Explain the importance of scheduled service routines to maintain machinery and equipment.
Two Skill/Concept	AST 3.2 Demonstrate suggested inspections on machinery and/or equipment.

AST 4: Examine principles of service and repair to mechanical and electrical equipment, power utilizations and technology.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AST 4.1 Evaluate internal and/or diesel combustion engines to assess needed service and repair.
Three Strategic Thinking	AST 4.2 Investigate service and repair specifications for operating systems.
Four Extended Thinking	AST 4.3 Diagnose problems associated with operating systems.
Two Skill/Concept	AST 4.4 Explore electric motor types, operation, and maintenance.

AST 5: Analyze emerging agriculture technologies.

Webb Level	*Sub-indicator*
Two Skill/Concept	AST 5.1 Analyze how emerging agriculture technologies have affected AFNR industries.

AST 6: Develop employability skills related to the Power, Structural, and Technical Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	AST 6.1 Develop soft skills to enhance employability.

AST 7: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AST 7.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AST 7.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AST 7.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AST 7.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AST 7.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Agribusiness Management

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18202
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Agribusiness Sales and Marketing – Agribusiness Management – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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), Registered Parliamentarian
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Agribusiness Pathway Endorsement; *Agriculture Education
Resources	

Course Description

Agribusiness Management is a semester-length or year-long high school elective that introduces the business, management, marketing, and financial skills needed to successfully produce food, fiber, and fuel for domestic and global markets. Students will learn about the components of the agribusiness system and how they interact to deliver food to our tables. They will also learn about the key elements of a successful agribusiness enterprise: economics, financial management, marketing and sales, and government policies and regulations. Developing a business plan for an AFNR business as an authentic assessment for the end of the course is recommended. Opportunities for application of clinical and leadership skills are provided by participation in FFA activities, conferences, and skills competitions such as sales related career development events and proficiency awards. Each student will be expected to maintain a Supervised Agricultural Experience Program/Internship.

Program of Study Application

Agribusiness Management is a second pathway course in the Agriculture, Food and Natural Resources Cluster, Agribusiness Systems Pathway. Agribusiness Management would be preceded by an Agribusiness Sales and Marketing and followed by a Capstone experience.

Course Standards

AM 1: Introduce the components of agribusiness management.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AM 1.1 Explain key business types and management principles and issues for the agribusiness enterprise.
One Recall	AM 1.2 Explain an overview of the knowledge and skills needed to work effectively within the agribusiness enterprises.
Two Skill/Concept	AM 1.3 Demonstrate leadership skills to accomplish goals and objectives in an agribusiness environment.

AM 2: Use record keeping to accomplish AFNR business objectives, manage budgets and comply with laws and regulations.

Webb Level	*Sub-indicator*
Two Skill/Concept	AM 2.1 Demonstrate key accounting fundamentals.
Two Skill/Concept	AM 2.2 Analyze and interpret agricultural policies in relation to their effects on the agribusiness management and agribusiness enterprises.

AM 3: Plan a marketing program utilizing various methods for sale of agricultural commodities and products.

Webb Level	*Sub-indicator*
Two Skill/Concept	AM 3.1 Explore strategies for the sale of agricultural commodities and products.
Four Extended Thinking	AM 3.2 Analyze budget and forecast models to determine optimal business marketing, strategies, and performances.

AM 4: Manage cash budgets, credit budgets, and credit for an AFNR business using generally accepted accounting principles (GAAP).

Webb Level	*Sub-indicator*
Three Strategic Thinking	AM 4.1 Develop, assess, and manage cash budgets to achieve AFNR business goals.
Three Strategic Thinking	AM 4.2 Analyze credit needs and manage credit budgets to achieve AFNR business goals.

AM 5: Develop employability skills related to the Agribusiness Pathway.

Webb Level	*Sub-indicator*
Two Develop	AM 5.1 Develop soft skills to enhance employability.
Three Strategic Thinking	AM 5.2 Model integrity, ethical leadership, and effective management.

AM 6 Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AM 6.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AM 6.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AM 6.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AM 6.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AM 6.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Agribusiness Sales and Marketing

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18201
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Cluster course – Agribusiness Sales and Marketing – Agribusiness Management – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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), Registered Parliamentarian
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Agribusiness Pathway Endorsement; *Agriculture Education
Resources	

Course Description

Agriculture businesses sell and market their products globally, regionally, and locally, leading to many related positions at these businesses. Skills related to selling and marketing products greatly enhance the success of an employee in an agribusiness operation. Agribusiness Sales and Marketing is designed to provide students with skills that focus on job preparatory skills as well as employee tasks necessary in agricultural sales and marketing occupations and the many career opportunities in the Agribusiness Systems Career Pathway. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Mathematics, English, 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. Developing a business plan for an AFNR business as an authentic assessment for the end of the course is recommended. Opportunities for application of clinical and leadership skills are provided by participation in FFA activities, conferences, and skills competitions such as sales related career development events and proficiency awards. Each student will be expected to maintain a Supervised Agricultural Experience Program/Internship.

Program of Study Application

Agribusiness Sales and Marketing is a first pathway course in the Agriculture, Food and Natural Resources Cluster, Agribusiness Systems Pathway. Agribusiness Sales and Marketing would be preceded by a cluster course and followed by Agribusiness Management.

Course Standards

ASM 1: Demonstrate the skills necessary to obtain and keep gainful employment in agribusiness occupations.

Webb Level	*Sub-indicator*
Two Skill/Concept	ASM 1.1 Use written and oral skills to seek and obtain an agricultural job.
Two Skill/Concept	ASM 1.2 Demonstrate Understanding of marketable skills to show personal growth.

ASM 2: Evaluate sales and marketing principles used to accomplish marketing objectives.

Webb Level	*Sub-indicator*
Four Extended Thinking	ASM 2.1 Write a marketing plan for a product based on marketing objectives.
Three Strategic Thinking	ASM 2.2 Merchandise products and services to meet the needs of a customer.

ASM 3: Use technology and documents to manage agribusiness inventory.

Webb Level	*Sub-indicator*
Two Skill/Concept	ASM 3.1 Apply reading comprehension, writing and math skills in inventory management.
Two Skill/Concept	ASM 3.2 Compare inventory management methods for various agribusinesses.

ASM 4: Evaluate opportunities for marketing of agricultural products throughout the world.

Webb Level	*Sub-indicator*
Two Skill/Concept	ASM 4.1 Locate areas of agricultural importance and determine the competitive advantage for production of agricultural products.
Three Strategic Thinking	ASM 4.2 Explore issues related to global food production and access.
Three Strategic Thinking	ASM 4.3 Investigate the process in developing international trading partners.

ASM 5: Use sales and marketing principles to accomplish AFNR business objectives (Nat #5)

Webb Level	*Sub-indicator*
Two Skill/Concept	ASM 5.1 Develop soft skills to enhance employability.
Three Strategic Thinking	ASM 5.2 Model integrity, ethical leadership, and effective management.

ASM 6: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	ASM 6.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	ASM 6.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	ASM 6.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	ASM 6.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	ASM 6.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Companion and Specialty Animal Science

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18102
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Foundation course – Cluster course – Companion Animals – Advanced Animal Science and/or Ag Biotechnology – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE), Capstone course
Industry Certifications	OSHA 10 Hour Safety Certification (General Industry), National Career Readiness Certificate (NCRC), Youth Humane Equine Management
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Animal Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description
Companion and Specialty Animal Science will address the basic knowledge and skills necessary to care for and meet the needs of companion animals, horses, specialty animals and exotics. Students will understand how to utilize appropriate equipment, learn anatomy and physiology, understand the structure of veterinary and small animal care services, and learn soft skills necessary for careers in the Agriculture, Food and Natural Resources sector. Utilizing appropriate equipment may enhance classroom and laboratory content, and technology, 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. This class is reinforced through the FFA and SAE activities such as the Livestock Evaluation Career Development Event and related Proficiency Awards. Each student will be expected to maintain a Supervised Agricultural Experience (SAE).

Program of Study Application
Companion and specialty animal science is a first pathway course in the Agriculture, Food and Natural Resources Program of Study, Animal Systems pathway. This course is preceded by a cluster course and is recommended to be taken prior to participation in Advanced Animal Science or Ag Biotechnology.

Course Standards

CA 1: Examine companion and specialty animal industries.

Webb Level	*Sub-indicator*
One Recall	CA 1.1 Investigate uses of companion and specialty animals.
Two Skill/Concept	CA 1.2 Define ethical standards of care for companion and specialty animals.
Two Skill/Concept	CA 1.3 Compare and contrast consumer concerns related to companion and specialty animals.

CA 2: Examine the anatomy and physiology of common companion/specialty animals.

Webb Level	*Sub-indicator*
Three Applying	CA 2.1 Explain the functional differences in anatomy and physiology of companion animals and specialty animals.
One Recall	CA 2.2 Identify scientific names and common species-specific terminology relevant to entry level conversations of common companion and specialty animals.
Three Analyzing	CA 2.3 Differentiate between species' reproductive cycles.

CA 3: Evaluate an animal's diet to provide proper nutrition and optimal performance.

Webb Level	*Sub-indicator*
Three Evaluating	CA 3.1 Evaluate an animal's developmental stage and use it to comprehend differences in nutrient requirements throughout the animal's life cycle.
Three Analyzing	CA 2.2 Analyze a feed label/ration to determine whether it fulfills a given animal's nutrient requirements.

CA 4: Demonstrate techniques for optimal care of an animal.

Webb Level	*Sub-indicator*
Three Applying	CA 4.1 Recognize optimum performance for a given animal species according to their use.
Three Evaluating	CA 4.2 Evaluate an animal's behavior and determine a strategy to safely work with it.
Three Evaluating	CA 4.3 Examine animal housing, equipment, transport systems, and handling facilities for the safety of animals and handlers.

CA 5: Explore Opportunities in veterinary services and animal care and maintenance.

Webb Level	*Sub-indicator*
Two Skills	CA 5.1 Explore career opportunities in veterinary and animal health services.
Three Evaluating	CA 6.1 Develop soft skills to enhance employability.

CA 6: Develop employability skills related to the Animal Systems Pathway.

Webb Level	*Sub-indicator*
Two Develop	CA 6.1 Develop soft skills to enhance employability.

CA 7: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	CA 7.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	CA 7.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	CA 7.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	CA 7.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	CA 7.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

CA 8: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AdS 8.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AdS 8.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AdS 8.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AdS 8.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AdS 8.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Food Science

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18305
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Cluster Course – Food Science – Ag Processing (Food and Fiber) - Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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), ServeSafe Food Manager, ServeSafe Food Handler, State Food Safety Food Handler Card
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Food Products and Processing Pathway Endorsement; *Agriculture Education
Resources	

Course Description

The state of South Dakota is diverse in the agriculture products it produces and the value-added food products available to the consumer. Food Science is a course designed to provide students with an overview of food science, food safety, and its importance to producers and consumers. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Mathematics, science, English and human relations skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises, field trips and internships. Opportunities for application of clinical and leadership skills are provided by participation in FFA through activities, conferences and skills competitions such as Career Development Event (CDE), Leadership Development Events and Agriscience Fair Research Projects. Each student will be expected to maintain a Supervised Agricultural Experience (SAE).

Program of Study Application

Food Science is a first pathway course in the Agriculture, Food and Natural Resources cluster, Food Product and Processing Systems pathway. Food Science would follow a cluster course and would prepare a student to participate in Ag Processing Technology (Food and Fiber).

Course Standards

FS 1: Understand and use safe practices.

Webb Level	*Sub-indicator*
Two Skill/Concept	FS 1.1 Demonstrate safe use and knowledge of tools and equipment used in this area.
Two Skill/Concept	FS 1.2 Demonstrate workplace/worksite safety procedures and protocols.

FS 2: Examine the makeup of the food industry.

Webb Level	*Sub-indicator*
Two Skill/Concept	FS 2.1 Investigate the local, national, and global food supply chain and market. advancements in food science techniques.
Two Skill/Concept	FS 2.2 Identify government organizations, producer organizations, companies, and other stakeholders their impact on the food industry.

FS 3: Apply safety and sanitation procedures for food production.

Webb Level	*Sub-indicator*
One Recall	FS 3.1 Identify origins of food borne pathogens and contaminants and effective prevention and control methods.
One Recall	FS 3.2 Describe proper safety and sanitation practices when working with food products.
Two Skill/Concept	FS 3.3 Demonstrate safe use and knowledge of tools, equipment and associated PPE.
Two Skill/Concept	FS 3.4 Apply safety and sanitation practices used in the food industry.

FS 4: Apply principles of science for producing safe, wholesome and nutritious food products.

Webb Level	*Sub-indicator*
Two Skill/Concept	FS 4.1 Apply fundamental chemistry to food science.
Two Skill/Concept	FS 4.2 Differentiate the makeup of food products.
Three Strategic Thinking	FS 4.3 Develop a food product that meets the standards of regulatory agencies.

FS 5: Develop employability skills related to the Food Product and Processing Systems.

Webb Level	*Sub-indicator*
Two Skill/Concept	FS 5.1 Develop soft skills to enhance employability.

FS 6: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	FS 6.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	FS 6.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	FS 6.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	FS 6.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	FS 6.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Fundamental Ag Mechanical Technologies

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18401
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Cluster Course – Fundamental Ag Mechanical Technologies – Ag Systems Technology or Ag Metal Fabrication – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Construction Industry or General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Power Structural & Technical Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description

Fundamental Ag Mechanical Technologies is offered to help students build basic knowledge and skills in the area of agricultural mechanics, along with soft skills necessary for careers in the Agriculture, Food and Natural Resources sector. Topics covered in this course include: electricity, engines and ag technology. More substantial knowledge on the individual topics comes in advanced courses such as Ag Systems Technology, Ag Metal Fabrication, and Fundamental Ag Structures. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, geometry, English and human relation skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises, industry speakers, job shadowing and field trips. This class is reinforced through the FFA and Supervised Agricultural Experience (SAE) programs, the Ag Mechanics Career Development Event, and related Proficiency Experience or Internship Project. Each student will be expected to maintain a SAE.

Program of Study Application

Fundamental Ag Mechanical Technologies is a first pathway course in the Agriculture, Food and Natural Resources Program of Study, Power Systems pathway. Fundamental Ag Mechanical Technologies is preceded by a Cluster course and is recommended to be taken prior to participation in Ag Systems Technology or Ag Metal Fabrication.

Course Standards

FAM 1: Apply safety practices in mechanical applications.

Webb Level	*Sub-indicator*
Two Skill/Concept	FAM 1.1 Explain the safe operation and servicing of machinery and equipment.
Three Strategic Thinking	FAM 1.2 Demonstrate safe operation and knowledge of ag mechanical tools.
Three Strategic Thinking	FAM 1.3 Demonstrate workplace/worksite safety procedures and protocols.

FAM 2: Identify maintenance procedures & schedules for mechanical equipment, power and agricultural technology.

Webb Level	*Sub-indicator*
Two Skill/Concept	FAM 2.1 Identify parts and explain functions of various mechanical systems.
Two Skill/Concept	FAM 2.2 Investigate common maintenance schedules and practices for equipment.
Three Strategic Thinking	FAM 2.3 Troubleshoot problems in mechanical systems.

FAM 3: Demonstrate basic skills in project planning and metal fabrication.

Webb Level	*Sub-indicator*
Three Strategic Thinking	FAM 3.1 Create designs of metal projects.
Two Skill/Concept	FAM 3.2 Demonstrate basic welding principles and techniques.
Three Strategic Thinking	FAM 3.3 Employ metal fabrication principles to create a metal project.

FAM 4: Apply electrical principles in agricultural applications.

Webb Level	*Sub-indicator*
One Recall	FAM 4.1 Recognize the components and functions of electrical systems.
Three Strategic Thinking	FAM 4.2 Demonstrate fundamental principles of electricity.

FAM 5: Investigate emerging agricultural technologies.

Webb Level	*Sub-indicator*
Two Skill/Concept	FAM 5.1 Investigate new and/or existing technology in agriculture.

FAM 6: Develop employability skills related to the Power, Structural, and Technical Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	FAM 6.1 Develop soft skills to enhance employability.

FAM 7: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	FAM 7.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	FAM 7.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	FAM 7.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	FAM 7.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	FAM 7.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Fundamental Ag Structures Technology

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18403
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 credit
Program of Study and Sequence	Cluster Course – Fundamental Ag Structures Technology – Advanced Ag Structures Technology- Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Construction Industry or General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Power Structural & Technical Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description

Fundamental Ag Structures Technology offers basic skills needed to be successful in the agricultural structures industry, such as the safe use of hand tools and power tools, drafting of structural plans, concrete and electrical fundamentals. The course will also incorporate soft skills necessary for careers in the Agriculture, Food and Natural Resources sector. South Dakota continues to face a shortage of certified electricians, plumbers and contractors, leaving these careers in high demand. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, geometry, trigonometry, English and human relations skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises, industry speakers, job shadowing and field trips. This class is reinforced through the FFA and Supervised Agricultural Experience (SAE) programs, the Ag Mechanics Career Development Event, and related Proficiency Experience or Internship Project. Each student will be expected to maintain a SAE.

Program of Study Application

Fundamental Ag Structures Technology is a first pathway course in the Agriculture, Food and Natural Resources Program of Study, Power Systems pathway. Fundamental Ag Structures Technology is preceded by a Cluster course and is recommended to be taken prior to participation in Advanced Ag Structures Technology.

Course Standards

AgS 1: Use safe practices associated with agriculture structures.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgS 1.1 Demonstrate safe use and knowledge of tools and equipment when constructing agricultural structures.
Two Skill/Concept	AgS 1.2 Demonstrate workplace/worksite safety procedures and protocols.

AgS 2: Develop plans for an agriculture structure project.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AgS 2.1 Use computer skills or drafting tools to develop sketches and plans for an ag structure.

AgS 3: Examine various materials required for an agricultural structure.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgS 3.1 Investigate the differences in materials needed to assemble an ag structure.
Three Strategic Thinking	AgS 3.2 Demonstrate knowledge of structural materials by developing a supply list, along with cost estimates for a given project.

AgS 4: Construct an agriculture structure.

Webb Level	*Sub-indicator*
Four Extended Thinking	AgS 4.1 Assemble components of a structure.
Four Extended Thinking	AgS 4.2 Create a complete agriculture structure by combining individually constructed components.

AgS 5: Demonstrate electrical principles.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgS 5.1 Explain basic electrical terms and principles.
Three Strategic Thinking	AgS 5.2 Use applicable instruments to demonstrate knowledge of basic electricity.
Three Strategic Thinking	AgS 5.3 Demonstrate wiring and electrical applications.

AgS 6: Analyze properties and conditions of building site prior to construction.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgS 6.1 Explain legal land descriptions and plat maps.
Three Strategic Thinking	AgS 6.2 Examine geographical characteristics of building site.
Two Skill/Concept	AgS 6.3 Understand and operate surveying equipment and/or GIS equipment.

AgS 7: Analyze various concrete and masonry concepts.

Webb Level	*Sub-indicator*
One Recall	AgS 7.1 Identify tools and materials used in concrete and masonry projects.
Two Skill/Concept	AgS 7.2 Accurately mix concrete.

AgS 8: Explore career opportunities in agricultural structures and mechanics.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgS 8.1 Investigate career opportunities that pertain to agricultural structures.
Two Skill/Concept	AgS 8.2 Develop soft skills to enhance employability.

AgS 9: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AgS 9.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AgS 9.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AgS 9.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AgS 9.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AgS 9.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Fundamental Animal Science

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18101
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Foundation course – Cluster course – Fundamental Animal Science – Advanced Animal Science - Ag Biotechnology – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Agriculture or General Industry), National Career Readiness Certificate (NCRC), Beef Quality Assurance, Youth Beef Quality Assurance, Youth Beef Industry Food Safety, Youth Humane Equine Management, Youth Quality Care Assurance, 4-H Horse
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Animal Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description
Fundamental Animal Science will address the basic knowledge and skills necessary to care for and meet the needs of animals, along with soft skills necessary for careers in the Agriculture, Food and Natural Resources sector. Topics addressed in the course include: animal anatomy and physiology, animal health, safely working with animals, animal nutrition, reproductive systems, animal performance, animal industry issues, animal products/marketing and employability. Utilizing appropriate equipment and technology should enhance classroom and laboratory content. Algebra, 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. This class is reinforced through the FFA and Supervised Agricultural Experience (SAE) activities such as the Livestock Evaluation Career Development Event and related Proficiency Awards. Each student will be expected to maintain a SAE.

Program of Study Application
Fundamental Animal Science is a first pathway course in the Agriculture, Food and Natural Resources Program of Study, Animal Systems pathway. Fundamental Animal Science is preceded by a Cluster course and is recommended to be taken prior to participation in Advanced Animal Science or Ag Biotechnology.

Course Standards

AN 1: Examine animal anatomy and physiology of domestic animals.

Webb Level	*Sub-indicator*
Two Skill/Concept	AN 1.1 Recognize and distinguish animals by species, breed, gender or use.
Three Strategic Thinking	AN 1.2 Analyze the parts and functions of an animal's internal and external anatomy.

AN 2: Analyze animal health indicators and responses.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AN 2.1 Evaluate the essential factors that determine the health status of an animal.
Three Strategic Thinking	AN 2.2 Analyze and investigate proper response to poor animal health and the proper usage and effects of animal health products.

AN 3: Demonstrate understanding of practices that promote safe human and animal interactions.

Webb Level	*Sub-indicator*
Four Extended Thinking	AN 3.1 Evaluate an animal's behavior and determine a strategy to safely work with it.
Three Strategic Thinking	AN 3.2 Examine and assess animal housing, equipment, and handling facilities for the safety of animals and humans.
Two Skill/Concept	AN 3.3 Critique management practices that support environmentally sustainable animal production.

AN 4: Distinguish elements of proper animal nutrition.

Webb Level	*Sub-indicator*
Two Skill/Concept	AN 4.1 Compare an animal's differing nutritional needs throughout its life cycle.
Three Strategic Thinking	AN 4.2 Prepare a feed ration according to animal nutrient requirements.

AN 5: Study the reproductive system of animals.

Webb Level	*Sub-indicator*
Two Skill/Concept	AN 5.1 Examine and compare male and female reproductive systems.
One Recall	AN 5.2 Discuss reproductive cycles and breeding techniques.
One Recall	AN 5.3 Identify essential elements of breeding soundness and readiness in males.
One Recall	AN 5.4 Define and identify elements of estrus, gestation and parturition.

AN 6 Identify factors that affect an animal's performance.

Webb Level	*Sub-indicator*
Four Extended Thinking	AN 6.1 Predict genetic outcomes.
Two Skill/Concept	AN 6.2 Assess an operation to determine if an animal has reached its optimum performance level.
Two Skill/Concept	AN 6.3 Recommend management strategies for animals performing at sub optimal level.

AN 7: Examine animal industry issues.

Webb Level	*Sub-indicator*
Two Skill/Concept	AN 7.1 Compare and contrast consumer concerns related to animal food products.
One Recall	AN 7.2 Define common terminology related to animal welfare.
Two Skill/Concept	AN 7.3 Analyze consumer perceptions related to animal welfare.

AN 8: Develop employability skills related to the Animal Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	AN 8.1 Develop soft skills to enhance employability.

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Fundamental Horticulture

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18052
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 credit
Program of Study and Sequence	Cluster Course – Fundamental Horticulture – Horticulture Operations or Advanced Plant Science - Capstone
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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), Commercial Pesticide Applicators Certification, Private Pesticide Applicators Certification
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Plant Systems Cluster Endorsement; *Agriculture Education
Resources	

Course Description

Fundamental Horticulture is designed to give students a background in horticultural science and the many career opportunities in nursery, garden, turf and landscape industries. Fundamental Horticulture addresses the biology and genetics involved in production, processing, and marketing of horticulture. Quality nursery and landscape operations require skilled, educated employees. In this course, students develop the necessary knowledge and skills for both entry-level employment and advancement within the horticulture industries. Topics covered include classifying and identifying plants, physiology and propagation, pest management, understanding soil, environmental, and fertility factors affecting plant growth, various horticulture industry sectors, and employability skills. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Mathematics, biology, English and human relations skills will be reinforced in the course. This class is reinforced through the FFA and Supervised Agricultural Experience (SAE) activities such as the Nursery/Landscape and Floriculture Career Development Events, and related Proficiency Awards. Each student will be expected to maintain a SAE.

Program of Study Application

Fundamental Horticulture is a first pathway course in the Agriculture, Food and Natural Resources Program of Study, Plant Systems pathway. Fundamental Horticulture is preceded by a Cluster course and would be followed by Horticulture Operations or Advanced Plant Science.

Course Standards

HORT 1: Understand and use safe practices.

Webb Level	*Sub-indicator*
Two Skill/Concept	HORT 1.1 Demonstrate safe use and knowledge of tools and equipment used in horticulture.
Two Skill/Concept	HORT 1.2 Demonstrate workplace/worksite safety procedures and protocols.

HORT 2: Explain horticultural plant classifications.

Webb Level	*Sub-indicator*
One Recall	HORT 2.1 Classify and identify horticultural plants.

HORT 3: Define basic principles of plant physiology and propagation.

Webb Level	*Sub-indicator*
Two Skill/Concept	HORT 3.1 Explain basic principles of plant physiology and growth.
Two Skill/Concept	HORT 3.2 Demonstrate the propagation of plants by sexual and asexual methods.

HORT 4: Describe pest management in the horticultural industry.

Webb Level	*Sub-indicator*
One Recall	HORT 4.1 Identify principles of pest management.

HORT 5: Analyze soil, environment, and fertility properties as they affect plant growth.

Webb Level	*Sub-indicator*
Two Skill/Concept	HORT 5.1 Examine soil and planting media management.
Three Strategic Thinking	HORT 5.2 Analyze information about the growing environment and its effect on plant growth.
One Recall	HORT 5.3 Identify plant nutrition practices for horticulture plants as they relate to plant growth and health.

HORT 6: Examine horticulture industry sectors.

Webb Level	*Sub-indicator*
Two Skill/Concept	HORT 6.1 Explain the care and maintenance of vegetable/fruit crops.
Two Skill/Concept	HORT 6.2 Investigate the floriculture industry.
Two Skill/Concept	HORT 6.3 Investigate the nursery/landscape industry.
Two Skill/Concept	HORT 6.4 Investigate the care and management of turf grass.

HORT 7: Develop employability skills related to the Plant Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	HORT 7.1 Develop soft skills to enhance employability.

HORT 8: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	HORT 8.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	HORT 8.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	HORT 8.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	HORT 8.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	HORT 8.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Fundamental Natural Resources

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18504
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Cluster course – Fundamental Natural Resources – Advanced Natural Resources or Wildlife and Fisheries – Capstone
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Natural Resources and Environmental Service Pathway Endorsement; *Agriculture Education
Resources	

Course Description

People depend on natural resources. Regions, cultures, nations, and societies are shaped by how people use land, water, plants, and wildlife. South Dakota's natural resources – minerals, forests, ranges, wetlands, lakes, rivers, soils, along with all connected domestic and native plant and animal communities – play an important role in its economic health, including mining, agriculture, outdoor recreation, and tourism. The large and small ecosystems that make up the environment are complex. Fundamental Natural Resources provides students with an overview of the planet's natural resource systems, along with examining those resources unique to South Dakota. Students will explore and develop a basic understanding of how the systems relate to one another. Students will consider the roles people play in, and the occupations related to, managing, using, protecting, and conserving natural resources. Classroom and laboratory content should be enhanced by utilizing up to date equipment and technology, such as Geographic Information System (GIS) software. Biology, statistics, algebra, English, and human relations skills will be reinforced throughout the course. Opportunities for application of clinical and leadership skills are provided by participation in FFA activities, conferences and skills competitions such as sales related career development events and proficiency awards. Each student will be expected to maintain a Supervised Agricultural Experience (SAE) Program/Internship.

Program of Study Application

Fundamental Natural Resources is a first pathway course in the Agriculture, Food and Natural Resources cluster, Natural Resources and Environmental Science Systems pathway. Fundamental Natural Resources would follow a cluster course and would prepare a student to participate in either Advanced Natural Resources or Wildlife and Fisheries.

Course Standards

FNR 1: Examine the importance of resource and human interrelations to conduct management activities in natural habitats.

Webb Level	*Sub-indicator*
One Recall	FNR 1.1 Explain resource management components to establish or enhance relationships in natural resource systems.
Two Skill/Concept	FNR 1.2 Explain GPS and GIS and how they impact natural resource management activities.
Two Skill/Concept	FNR 1.3 Examine planning data to determine natural resource status.
One Recall	FNR 1.4 Discuss safety related to weather and other criteria in an outdoor environment.
Two Skill/Concept	FNR 1.5 Investigate forestry management techniques.
Two Skill/Concept	FNR 1.6 Define and Investigate the role of ecosystem services and their impact on human society.

FNR 2: Interpret scientific principles of natural resource management activities.

Webb Level	*Sub-indicator*
One Recall	FNR 2.1 Identify and classify plant- and animal-based natural resources.
Two Skill/Concept	FNR 2.2 Identify natural cycles and related phenomena to describe ecological concepts and principles.
Two Skill/Concept	FNR 2.3 Examine soil compositions, properties, and health.
Two Skill/Concept	FNR 2.4 Demonstrate techniques used to classify soils.
Two Skill/Concept	FNR 2.5 Explain the importance of soil conservation.
Three Strategic Thinking	FNR 2.6 Analyze wetland, watershed and groundwater properties, classifications and functions.

FNR 3: Describe production practices and processing procedures for natural resources.

Webb Level	*Sub-indicator*
One Recall	FNR 3.1 Describe how natural resource products are produced, harvested, processed and used.

FNR 4: Develop employability skills related to the AFNR Cluster.

Webb Level	*Sub-indicator*
Two Skill/Concept	FNR 4.1: Develop soft skills to enhance employability.

FNR 5: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	FNR 5.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	FNR 5.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	FNR 5.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	FNR 5.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	FNR 5.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

FNR 6: Explain responsible practices to protect natural resources.

Webb Level	*Sub-indicator*
One Recall	FNR 6.1 Describe techniques and equipment needed to manage and conserve natural resources.
Two Skill/Concept	FNR 6.2 Discuss animal and plant disease symptoms and prevention.
One Recall	FNR 6.3 Recognize insect types and available controls to prevent insect infestation.

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Fundamental Plant Science

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18051
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	0.5 credit
Program of Study and Sequence	Cluster Course – Fundamental Plant Science – Advanced Plant Science (Agronomy) or Advanced Horticulture - Capstone
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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), Commercial Pesticide Applicator Certification, Private Pesticide Applicator Certification
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Plant Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description

The plant science industry is a large part of the economic structure in South Dakota, from crop and forage production to horticulture and forestry. Every corner of South Dakota is involved in the plant science field. In this course, students develop the necessary knowledge, skills, habits and attitudes for both entry-level employment and advancement in areas such as production agriculture, research, and horticulture, including the soft skills necessary to be successful. Topics covered in this course include plant anatomy and physiology, environmental impacts and plant growth, production and harvesting, and employability skills. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, biology, English and human relations skills will be reinforced in the course. Fundamental Plant Science is reinforced through the FFA and Supervised Agricultural Experience (SAE) activities such as the Agronomy Career Development Event and related Proficiency Awards. Each student will be expected to maintain a SAE.

Program of Study Application

Fundamental Plant Science is a first pathway course in the Agriculture, Food and Natural Resources Program of Study, Plant Systems pathway. Fundamental Plant Science is preceded by a Cluster course and would be followed by Advanced Plant Science (Agronomy) or Advanced Horticulture.

Course Standards

PS 1: Understand and use safe practices.

Webb Level	*Sub-indicator*
Two Skill/Concept	PS 1.1 Demonstrate safe use and knowledge of tools and equipment used in this area.
Two Skill/Concept	PS 1.2 Demonstrate workplace/worksite safety procedures and protocols.

PS 2: Explain principles of anatomy and physiology in plants.

Webb Level	*Sub-indicator*
One Recall	PS 2.1 Describe functional differences in plant structures including roots, stems, flowers, leaves, and fruits.
One Recall	PS 2.2 Classify and identify plants.

PS 3: Manipulate the environment to promote optimal growth in plants.

Webb Level	*Sub-indicator*
Two Skill/Concept	PS 3.1 Determine nutritional requirements for optimal plant growth.
Two Skill/Concept	PS 3.2 Examine data to evaluate and manage soil/media and nutrients.

PS 4: Evaluate fundamentals of production and harvesting of plants.

Webb Level	*Sub-indicator*
Two Skill/Concept	PS 4.1 Analyze a production plan for optimal plant production.
Three Strategic Thinking	PS 4.2 Examine the basic methods for reproducing and propagating plants.
Three Strategic Thinking	PS 4.3 Examine fundamentals to harvest, handle, store, and market crops.

PS 5: Explore employability skills within the plant science industry.

Webb Level	*Sub-indicator*
Two Skill/Concept	PS 5.1 Develop soft skills to enhance employability.

PS 6: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	PS 6.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	PS 6.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	PS 6.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	PS 6.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	PS 6.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Horticulture Operations

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18053
Prerequisite(s)	Recommended Intro to AFNR, Fundamental Plant Science AND/OR Fundamental Horticulture
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Fundamental Horticulture – Horticulture Operations – Ag Biotechnology - Capstone
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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), Private Pesticide Applicator Certification, Commercial Pesticide Applicator Certification
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture, Food and Natural Resources Cluster Endorsement; Plant Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description

Horticulture Operations is designed for instructors to customize the curriculum to local industry needs. Standards can be met by utilizing one or more of the following horticulture sectors: Landscape Design, Floriculture and/or Greenhouse Management. Topics include identification, use and management of equipment and materials, as well as managing plant growth and maintaining plants and equipment. Employment skills are an additional emphasis. All three of these industry sectors require skilled, educated employees. Classroom and laboratory content will be enhanced by utilizing appropriate equipment and technology. Mathematics, (geometry), science (physical science, biology, Chemistry), English and human relations skills will be reinforced in the course. Opportunities for application of clinical and leadership skills are provided by participation in FFA through activities, conferences and skills competitions. Each student will be expected to maintain a Supervised Agricultural Experience (SAE) program.

Program of Study Application

Horticulture Operations is a second pathway course in the Agriculture, Food and Natural Resources Program of Study, Plant Systems pathway. Horticulture Operations is preceded by Fundamental Horticulture and would be followed by Ag Biotechnology.

Course Standards

ADVH 1: Understand and use safe practices.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADVH 1.1 Demonstrate safe use and knowledge of tools and equipment used in horticulture operations.
Two Skill/Concept	ADVH 1.2 Demonstrate workplace/worksite safety procedures and protocols.

ADVH 2: Identify plants, equipment and materials utilized in the horticulture industry.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADVH 2.1 Identify and categorize plants by their purpose.
Two Skill/Concept	ADVH 2.2 Identify and demonstrate proper use of tools and equipment used in horticultural industries.
One Recall	ADVH 2.3 Identify supplies and materials used in horticulture.
Four Extended Thinking	ADVH 2.4 Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.

ADVH 3: Develop and implement a horticulture management plan.

Webb Level	*Sub-indicator*
Three Strategic Thinking	ADVH 3.1 Determine the influence of environmental and nutritional factors on plants.
Four Extended Thinking	ADVH 3.2 Apply plant management and care practices.
Two Skill/Concept	ADVH 3.3 Demonstrate and communicate understanding of specialized growing techniques.

ADVH 4: Apply principles of design in plant systems to enhance an environment.

Webb Level	*Sub-indicator*
Three Strategic Thinking	ADVH 4.1 Compare plants based on quality and function.
Four Extended Thinking	ADVH 4.2 Create designs using plants.
Four Extended Thinking	ADVH 4.3 Apply concepts of proper use of plants in their environment.
Two Skill/Concept	ADVH 4.4 Evaluate a design and provide feedback and suggestions for improvement.

ADVH 5: Develop a business plan for owning and/or operating a horticulture business.

Webb Level	*Sub-indicator*
Four Extended Thinking	ADVH 5.1 Apply concepts of business management to a horticulture business

ADVH 6: Develop employability skills related to the Plant Systems Pathway.

Webb Level	*Sub-indicator*
Two Develop	ADVH 6.1 Develop soft skills to enhance employability.

ADVH 7 Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	ADVH 7.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	ADVH 7.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	ADVH 7.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	ADVH 7.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	ADVH 7.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Independent Supervised Agricultural Experience (SAE)

Career Cluster	Agriculture, Food and Natural Resources
Course Code	
Prerequisite(s)	None
Credit	0.5 credit each year, up to 2 credits per student maximum (90 hours of recorded work time = 0.5 credit)
Program of Study and Sequence	This course can be used to supplement Agriculture, Food and Natural Resources programs of study and is designed to evolve with a student through high school. Students must also take at least .5 credits of an AFNR course during the same school year to qualify for FFA membership
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Meets work-based learning expectations
Industry Certifications	OSHA 10 Hour Safety Certification (General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture, Food, and Natural Resources
Resources	SAE for All

Course Description

A Supervised Agricultural Experience (SAE) is a structured experiential learning opportunity that takes place in a setting outside of regular school hours. SAE is student-led, instructor-supervised, work-based learning experience that results in measurable outcomes within a predefined, agreed upon set of Agriculture, Food and Natural Resources (AFNR) Technical Standards and Career Ready Practices aligned to the student's career plan of study. SAEs allow students to experience the diversity of agriculture and natural resources industries and to gain exposure to agricultural-related career pathways. SAEs require a documented formal project scope, accurate recordkeeping, and advisor supervision. The SAE is conducted by all students in the agricultural education program. It consists of four components: (1) career exploration and planning, (2) personal financial management and planning, (3) workplace safety, (4) agricultural literacy and exploration.

SAE credits do not count toward FFA membership requirement of .5 credit per year.
Hours are completed outside of AFNR classroom time. General instruction in SAE occurs within each AFNR course.

Course Standards

SAE 1: Examine the general philosophy and objectives of SAE programs.

Webb Level	*Sub-indicator*
One Recall	SAE 1.1 Identify and describe the types of SAEs.
Two Skill/Concept	SAE 1.2 Compare and contrast the applications and benefits of different types of SAEs.
Three Strategic Thinking	SAE 1.3 Communicate understanding by selecting a specific project to build knowledge and skills in a particular agriculture area.

SAE 2 Utilize project management and recordkeeping skills.

Webb Level	*Sub-indicator*
Three Strategic Thinking	SAE 2.1 Formulate annual SMART goals for the SAE project or placement and apply the concepts of project planning to monitor and evaluate SAE progress.
Two Skill/Concept	SAE 2.2 Accurately maintain a prescribed recordkeeping system and apply proper financial record keeping skills as required by the specific project.
Three Strategic Thinking	SAE 2.3 Utilize records to direct students' future project plans.
Four Extended Thinking	SAE 2.4 Conduct at least 90 hours of research, work, or activities related to the chosen SAE project.
Four Extended Thinking	SAE 2.5 Complete an FFA award application.

SAE 3: Demonstrate personal growth and exhibit characteristics important to career success.

Webb Level	*Sub-indicator*
Three Strategic Thinking	SAE 3.1 Develop personal SMART goals and conduct activities to work toward individual and career development.
Two Skill/Concept	SAE 3.2 Explore and compare regional career opportunities from multiple sources.
Four Extended Thinking	SAE 3.3 Identify and develop knowledge and technical skills necessary for selected careers.
Four Extended Thinking	SAE 3.4 Develop soft skills.

SAE 4: Develop and demonstrate leadership skills.

Webb Level	*Sub-indicator*
Two Skill/Concept	SAE 4.1 Exhibit leadership skills needed for careers in the AFNR industry.
Three Strategic Thinking	SAE 4.2 Engage in youth leadership opportunities to practice and develop effective leadership skills.

SAE 5: Understand and demonstrate occupational safety and ethics.

Webb Level	*Sub-indicator*
Two Skill/Concept	SAE 5.1 Demonstrate appropriate health and safety procedures for activities aligned with SAE project.
Three Strategic Thinking	SAE 5.2 Identify and discuss occupational ethics, legal responsibilities, and regulatory compliance issues in relation to specific activities and/or careers aligned with SAE projects.

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Introduction to AFNR

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18001
Prerequisite(s)	None
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Foundation Course – Introduction to Agriculture, Food & Natural Resources – Pathway Course - Capstone
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Agricultural, Construction Industry, or General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; *Agriculture Education
Resources	

Course Description

This course allows students to study a variety of agricultural topics across the six Agriculture, Food, and Natural Resources pathways including natural resources, animal and plant science, food products and process systems, and agribusiness. It serves as an introduction to much of the coursework included within the AFNR cluster. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, biology, English and human relations skills will be reinforced in the course. Application of clinical and leadership skills are provided by participating in activities, conferences, and skills competitions such as the Career Development Events and proficiency awards. Each student will be expected to maintain a Supervised Agricultural Experience (SAE).

Program of Study Application

Introduction to Agriculture, Food & Natural Resources is a cluster course in the Agriculture, Food and Natural Resources cluster. Introduction to Agriculture, Food & Natural Resources would be preceded by a foundation course and would prepare a student to take a first-level course in any of the Agriculture, Food and Natural Resources pathways.

Course Standards

ITA 1: Examine the role of FFA in agricultural education programs.

Webb Level	*Sub-indicator*
One Recall	ITA 1.1 Summarize the history, organization, and traditions of FFA.
One Recall	ITA 1.2 Explore opportunities in FFA.
Two Skill/Concept	ITA 1.3 Demonstrate proper use of parliamentary procedure.

ITA 2: Describe the types of Supervised Agricultural Experiences.

Webb Level	*Sub-indicator*
One Recall	ITA 2.1 Evaluate the benefits and types of SAE programs.
Three Strategic Thinking	ITA 2.2 Develop a plan and maintain SAE records.

ITA 3: Discuss the concept of natural resources.

Webb Level	*Sub-indicator*
Two Skill/Concept	ITA 3.1 Classify different types of natural resources to enable protection, conservation, enhancement, and management in a particular geographical region.
One Recall	ITA 3.2 Explore South Dakota fish and wildlife species and investigate their ecological needs.
Two Skill/Concept	ITA 3.3 Explain human interaction with natural resources, fish, and wildlife.

ITA 4: Describe the animal science industry.

Webb Level	*Sub-indicator*
One Recall	ITA 4.1 Examine the large and small animal science industries.
Two Skill/Concept	ITA 4.2 Analyze historic and current trends impacting the animal science industry.

ITA 5: Describe plant science industry.

Webb Level	*Sub-indicator*
One Recall	ITA 5.1 Examine the plant science and horticulture industries.
Two Skill/Concept	ITA 5.2 Analyze historic and current trends impacting the plant science and horticulture industries.

ITA 6: Summarize basic agricultural business principles.

Webb Level	*Sub-indicator*
Two Skill/Concept	ITA 6.1 Investigate various principles and concepts in different AFNR businesses.

ITA 7: Explore food products and process systems industry.

Webb Level	*Sub-indicator*
One Recall	ITA 7.1 Illustrate how raw commodities become table-ready food products.
One Recall	ITA 7.2 Explain basic food safety principles.

ITA 8: Use basic principles of agricultural power, structural, and technical systems technology.

Webb Level	*Sub-indicator*
Two Skill/Concept	ITA 8.1 Explore basic principles involved in agricultural power, structural, and technical systems technology.
Two Skill/Concept	ITA 8.2 Understand, demonstrate, and use proper safety procedures and equipment.

ITA 9: Develop employability skills related to the AFNR cluster.

Webb Level	*Sub-indicator*
Two Skill/Concept	ITA 9.1 Develop soft skills to enhance employability.

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Issues in Environmental Science

Career Cluster	Agriculture, Food and Natural Resources
Course Code	
Prerequisite(s)	None
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Cluster Course – Environmental Science – Pathway Course- Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, service learning, workplace tours, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Agricultural, Construction Industry, or General Industry), National Career Readiness Certificate (NCRC)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Natural Resources & Environmental Service System Pathway Endorsement; 7-12 Science – Biology; *Agriculture Education
Resources	

Course Description
Agriculture and tourism are South Dakota's two leading industries. For these industries to thrive, we must continue to protect and manage the environment with conservation in mind. Environmental Science is a course that enables students to develop an understanding of the natural environment and the environmental problems the world faces. Biology, statistics, algebra, English, and human relations skills will be reinforced throughout the course. Opportunities for application of clinical and leadership skills are provided by participation in FFA activities, conferences and related career development events and proficiency awards. Each student will be expected to maintain a Supervised Agricultural Experience (SAE) Program/Internship.

Program of Study Application
Environmental Science is a pathway course in the Agriculture, Food and Natural Resources Cluster and Environmental Service Systems Pathway. Environmental Science would follow a cluster course and will prepare a student to participate in Fundamental Natural Resources or Agriculture Biotechnology.

Course Standards

IES 1: Examine ecological principles and functions.

Webb Level	*Sub-indicator*
Two Skill/Concept	IES 1.1 Examine the structure and function of ecosystems.
Four Extended Thinking	IES 1.2 Analyze the major biomes of the earth and the biodiversity associated with these biomes.
Four Extended Thinking	IES 1.3 Analyze population dynamics.

IES 2: Evaluate human population dynamics on the environment.

Webb Level	*Sub-indicator*
Four Extended Thinking	IES 2.1 Evaluate factors affecting the human population.
Four Extended Thinking	IES 2.2 Evaluate the consequences of human population growth.
Four Extended Thinking	IES 2.3 Evaluate approaches that address overpopulation.

IES 3: Appraise our natural resources, their conservation and management.

Webb Level	*Sub-indicator*
One Recall	IES 3.1 Explain the types, uses and history of renewable and nonrenewable resources.
Three Strategic Thinking	IES 3.2 Assess methods of conservation of common non–energy natural resources.
Two Skill/Concept	IES 3.3 Examine the impact of waste production and management on the environment.

IES 4: Examine energy sources and their conservation.

Webb Level	*Sub-indicator*
Two Skill/Concept	IES 4.1 Compare and contrast conventional and alternative energy sources.
Two Skill/Concept	IES 4.2 Examine the types of energy-related pollution.
Two Skill/Concept	IES 4.3 Compare various methods of energy conservation.

IES 5: Examine consequences of human interaction with the environment.

Webb Level	*Sub-indicator*
Two Skill/Concept	IES 5.1 Examine the causes, environmental effects and methods for controlling pollution.
Two Skill/Concept	IES 5.2 Examine environmental impact on human health.
Four Extended Thinking	IES 5.3 Appraise the sustainability of human practices as they relate to water quality, agriculture/forestry/fishing, mining, energy and land use.

IES 6: Appraise personal and civic responsibility with regard to the environment.

Webb Level	*Sub-indicator*
Four Extended Thinking	IES 6.1 Evaluate personal views concerning the environment.
Four Extended Thinking	IES 6.2 Evaluate the rights and responsibilities of citizens in maintaining a healthy environment.

IES 7: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	IES 7.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	IES 7.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	IES 7.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	IES 7.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	IES 7.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.

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Middle School AFNR

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18000
Prerequisite(s)	None
Credit	0.5 or 1.0 credit
Program of Study and Sequence	Foundation Course – Middle School Agriculture, Food & Natural Resources – Pathway Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, service learning, workplace tours, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Agricultural, Construction Industry, or General Industry)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; *Agriculture Education
Resources	

Course Description
Middle School Agriculture, Food and Natural Resources allows students to study a variety of agricultural topics throughout the Agriculture, Food, and Natural Resources pathways. It serves as an introduction to much of the coursework included within the AFNR cluster. Students are encouraged to explore opportunities within the national FFA organization and develop a supervised agricultural experience program. Application of clinical and leadership skills are provided by participating in FFA activities, conferences, and skills competitions such as the Career Development Events and proficiency awards. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, biology, English, and human relations skills will be reinforced in the course.

Program of Study Application
Middle School Agriculture, Food & Natural Resources is a cluster course in the Agriculture, Food and Natural Resources Cluster. Middle School Agriculture, Food & Natural Resources would be followed by a foundation course and will prepare a student to enter a pathway course in any of the Agriculture, Food & Natural Resources pathways.

Course Standards

ExAg 1: Establish an understanding of the three main parts of the agricultural education program.

Webb Level	*Sub-indicator*
One Recall	ExAg 1.1 Define Supervised Agricultural Experience Program.
One Recall	ExAg 1.2 Explore opportunities in the local chapter, State Association, and National FFA Organization.
One Recall	ExAg 1.3 Demonstrate an understanding of the local Agricultural Education program.

ExAg 2: Express the importance of agriculture, food and natural resources in daily life.

Webb Level	*Sub-indicator*
One Recall	ExAg 2.1 Give examples of how the agriculture industry provides basic human needs (food, clothing, shelter).
Three Strategic Thinking	ExAg 2.2 Discuss the evolution of the agriculture industry.
Two Skill/Concept	ExAg 2.3 Summarize the importance of agriculture, food and natural resources to South Dakota's economy.

ExAg 3: Explore different pathways in the Agriculture, Food, and Natural Resources Cluster.

Webb Level	*Sub-indicator*
Two Skill/Concept	ExAg 3.1 Identify the different pathways in AFNR.
Three Strategic Thinking	ExAg 3.2 Examine career opportunities in the AFNR pathways.
Two Skill/Concept	ExAg 3.3 Use appropriate protective equipment and demonstrate safe and proper use of AFNR tools and equipment.

ExAg 4: Develop employability skills related to the AFNR Cluster.

Webb Level	*Sub-indicator*
Two Skill/Concept	ExAg 4.1 Develop soft skills to enhance employability.

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Wildlife and Fisheries

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18501
Prerequisite(s)	None
Credit	0.5 - 1
Program of Study and Sequence	Cluster course – Fundamental Natural Resources – **Wildlife and Fisheries** – Capstone experience
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, 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	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Natural Resources & Environmental Sciences Pathway Endorsement; *Agriculture Education
Resources	

Course Description:
Management of South Dakota's wildlife and fisheries is critical to our future economic stability. Skills gained in this area will be beneficial to students seeking careers in the many facets of wildlife and fisheries. The Wildlife and Fisheries course addresses the biological and environmental issues related to wildlife and fisheries management within our state. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Biology, English and human relations skills will be reinforced throughout 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 activities, conferences and skills competitions such as the Natural Resources Career Development Event or related proficiency award areas. All students are expected to maintain a Supervised Agricultural Experience program.

Program of Study Application
Wildlife and Fisheries is a second pathway course in the Agriculture, Food and Natural Resources
cluster, Natural Resources and Environmental Science Systems pathway. Wildlife and Fisheries would
follow Fundamental Natural Resources and would prepare a student to participate in a capstone
experience.

Course Standards

WF 1 Demonstrate the importance of fish and wildlife management, including their respective habitats.

Two Skill/Concept	WF 1.1 Demonstrate understanding of natural resource components to the management of wildlife and fish.
One Recall	WF 1.2 Identify fish and wildlife species.
Two Skill/Concept	WF 1.3 Identify healthy habitat for wildlife and fish.

WF 2 Identify economic and social issues related to fish and wildlife

Two Skill/Concept	WF 2.1 Discuss hunting/harvesting fish and wildlife species as a management technique.
Two Skill/Concept	WF 2.2 Investigate processing techniques to use game and fish as food sources.
Three Strategic Thinking	WF 2.3 Demonstrate safety practices related to hunting and fishing activities.
Two Skill/Concept	WF 2.4 Investigate impact of invasive species on wildlife and fisheries.

WF 3 Compare life patterns of fish and wildlife.

One Recall	WF 3.1 Identify seasonal rituals of fish and wildlife species.
Three Strategic Thinking	WF 3.2 Diagnose wildlife and fish diseases.
Four Extended Thinking	WF 3.3 Create a plan to mitigate wildlife and fish diseases.

WF 4 Investigate careers in wildlife and fisheries conservation.

Two Skill/Concept	WF 4.1 Locate, identify, research and interpret career information.
Two Skill/Concept	WF 4.2 Compare and contrast characteristics of various careers.

WF 5 Develop employability skills related to the Animal Systems Pathway.

Two Skill/Concept	WF 5.1 Develop soft skills to enhance employability.