



Fundamental Plant Science

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18051
Prerequisite(s)	Recommended: Introduction to AFNR
Credit	.5
Graduation Requirement	No
Program of Study and Sequence	Cluster Course – Fundamental Plant Science – Advanced Plant Science (Agronomy) or Advanced Horticulture
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	
Teacher Certification	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 Explain principles of anatomy and physiology in plants.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Recall	PS 1.1 Describe functional differences in plant structures including roots, stems, flowers, leaves, and fruits.	<ul style="list-style-type: none"> • Identify plant parts and functions. • Contrast between monocotyledon and dicotyledon. • Describe types of root systems. • Identify plant growth stages. • Describe the absorption process. • Paraphrase photosynthesis. • Describe respiration. • Explain the transpiration process.

<p>One Recall</p>	<p>PS 1.2 Classify and identify plants.</p>	<ul style="list-style-type: none"> • Explain agricultural plants and their uses. • Recognize major crops of South Dakota. • Classify plants as monocots or dicots. • Classify plants as annuals, biennials, or perennials. • Identify common and noxious weeds. • Classify growth characteristics of weeds.
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Notes

PS 2 Manipulate the environment to promote optimal growth in plants.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
<p>Two Skill/Concept</p>	<p>PS 2.1 Determine nutritional requirements for optimal plant growth.</p>	<ul style="list-style-type: none"> • Experiment with plant growth regulators. • Compare plant nutritional requirements. • Illustrate the nitrogen cycle. • Differentiate plant nutrient deficiency symptoms. • Describe nutrient application methods and appropriate practices. • Summarize effects of water quality and conditions on plant growth.

Two Skill/Concept	PS 2.2 Examine data to evaluate and manage soil/media and nutrients.	<ul style="list-style-type: none">• Test soil/media and plant tissue for nutrient levels.• Interpret tests of soil/media and/or plant tissue.• Compare soil slopes, textures and structures.• Experiment with soil/media permeability and water-holding capacity.• Compare environmental factors that influence and optimize plant growth.• Determine land use capability.
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Notes

PS 3 Evaluate fundamentals of production and harvesting of plants.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	PS 3.1 Analyze a production plan for optimal plant production.	<ul style="list-style-type: none"> • Identify factors affecting crop selection. • Compare methods for seedbed preparation. • Examine method of seeding. • Compare conventional, reduced-tillage and no-till concepts. • Investigate sustainable and conventional methods of pest and weed management. • Identify technology and equipment used in plant production.
Two Skill/Concept	PS 3.2 Compare the basic methods for reproducing and propagating plants.	<ul style="list-style-type: none"> • Examine the methods of vegetative reproduction. • Experiment with plant germination rate factors. • Compare methods of asexual/sexual plant propagation. • Examine methods of plant pollination. • Distinguish between the components and functions of plant reproductive parts.
Two Skill/Concept	PS 3.3 Examine fundamentals to harvest, handle, store, and market crops.	<ul style="list-style-type: none"> • Compare agronomic and horticultural crops. • Examine crop maturity. • Appraise methods of crop harvesting. • Compare crop storage facilities. • Monitor crop quality in storage.

Notes

PS 4 Explore employability skills within the plant science industry.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Skill/Concept	PS 4.1 Develop soft skills to enhance employability.	

Notes