New Mexico Agriculture, Food & Natural Resources Course Framework

Applied Science in Agriculture (0136)

Suggested Course Length: 180 Days

AFNR Pathway: Animal Systems (AS), Plant Systems (PS), Environmental Service Systems (ESS), Natural Resource Systems (NRS)

Prerequisite: Agricultural Science (0132) Recommended

Instructional Design Philosophy

Applied Science in Agriculture is an advanced applied science course designed to extend student understanding of animal systems, horticulture, natural resources, wildlife management, and environmental stewardship through experiential learning and scientific application. Students investigate real-world agricultural issues while applying scientific principles to solve problems facing modern agriculture.

The **SAE serves as the backbone of instruction**. Students should develop or expand research, placement, ownership, or entrepreneurship SAE aligned with animal systems, greenhouse production, nursery operations, landscape management, wildlife conservation, forestry, or environmental resources.

Course-at-a-Glance

Quarter	Units	Days
Q1	Units 1-3	45
Q2	Units 4-6	45
Q3	Units 7-9	45

Quarter	Units	Days
Q4	Units 10-12	45

Unit 1: Current Issues in Agriculture

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Current Agricultural Issues	CRP.01 Career Planning & Industry Awareness	Current Issue Research Report	USDA, Farm Bureau, NMSU Extension	Exploratory SAE
Agricultural Policy and Public Perception	CRP.04 Communication Skills	Agricultural Advocacy Presentation	FFA Resources	Agricultural Communications
Agriculture and Society	CRP.05 Critical Thinking	Issue Analysis Debate	MyCAERT	Leadership SAE

Unit Assessment

- Agricultural Issues Research Paper
- Advocacy Presentation

Unit 2: Agricultural Marketing and Consumer Trends

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Marketing Principles	ABS.01 Economic Principles and Business Environment	Marketing Analysis	USDA AMS Resources	Entrepreneurship SAE
Consumer Preferences	ABS.01 Market Analysis	Consumer Preference Survey	Industry Marketing Materials	Agribusiness SAE
Agricultural Sales Techniques	CRP.04 Communication Skills	Sales Demonstration	Agricultural Sales CDE Resources	Agricultural Sales CDE

Unit Assessment

- Consumer Marketing Project
- Agricultural Sales Activity

Unit 3: Animal Health and Disease Management

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Managing Diseases and Parasites	AS.05 Animal Health	Disease Identification Lab	Veterinary Resources	Livestock SAE
Animal Health Management	AS.05 Animal Health Practices	Health Management Plan	Extension Publications	Animal Ownership SAE
Equipment for Animal Health	AS.05 Animal Care Systems	Equipment Identification Practicum	Industry Catalogs	Veterinary Science CDE

Unit Assessment

- Animal Health Portfolio
- Parasite Management Project

Unit 4: Livestock Facilities and Waste Management

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Livestock Facility Design	AS.07 Animal Production Systems	Facility Layout Plan	NRCS Resources	Production SAE
Livestock Waste Management	ESS.02 Environmental Stewardship	Waste Management Plan	Extension Resources	Livestock SAE
Biosecurity Practices	AS.05 Animal Health Systems	Biosecurity Assessment	Veterinary Resources	Animal Systems SAE

Unit Assessment

- Livestock Facility Design Project

Unit 5: Animal Welfare and Consumer Relations

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Animal Welfare Issues	AS.08 Animal Ethics and Welfare	Welfare Assessment	Industry Guidelines	Livestock SAE
Training and Conditioning	AS.07 Animal Management Practices	Conditioning Program	Show Animal Resources	Livestock Production SAE
Consumer Expectations	CRP.04 Agricultural Communication	Consumer Awareness Presentation	Industry Publications	Agricultural Advocacy

Unit Assessment

- Animal Welfare Case Study

Unit 6: Greenhouse Management

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Greenhouse Structures	PS.04 Controlled Environment Agriculture	Greenhouse Evaluation	Greenhouse Manufacturers	Greenhouse SAE
Climate Control Systems	PS.04 Environmental Control Systems	Climate Management Plan	Greenhouse Resources	Plant Production SAE
Automated Greenhouse Systems	PST.05 Technology Applications	Automation Analysis	Industry Technology Vendors	Entrepreneurship SAE

Unit Assessment

- Greenhouse Management Portfolio

Unit 7: Nursery and Crop Production

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Nursery Production Facilities	PS.01 Plant Production Systems	Nursery Facility Analysis	Nursery Industry Resources	Nursery SAE
Producing Nursery Crops	PS.03 Plant Reproduction & Production	Crop Production Record	Greenhouse Curriculum	Production SAE
Packaging Nursery Crops	ABS.01 Product Marketing Concepts	Product Packaging Project	Industry Examples	Entrepreneurship SAE

Unit Assessment

- Nursery Production Project

Unit 8: Fruit and Vegetable Production

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Garden Site Preparation	PS.01 Plant Growth Factors	Garden Plan	NMSU Extension	Gardening SAE
Vegetable Production	PS.01 Plant Production Systems	Crop Journal	School Garden Resources	Production SAE
Small Fruit and Tree Fruit Production	PS.01 Crop Management	Fruit Production Calendar	Specialty Crop Resources	Entrepreneurship SAE

Unit Assessment

- Fruit and Vegetable Production Portfolio

Unit 9: Landscape Design and Management

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Landscape Planning	PS.05 Landscape Systems	Landscape Design Project	Landscape Design Software	Landscape SAE
Principles of Design	PS.05 Landscape Design Principles	Design Portfolio	Landscape Curriculum	Entrepreneurship SAE
Landscape Business Management	ABS.01 Business Operations	Landscape Business Plan	SBA Resources	Landscape Enterprise SAE

Unit Assessment

- Residential Landscape Design Project

Unit 10: Forestry Management

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Fire in Forest Management	NRS.03 Forest Resource Management	Fire Management Analysis	Forestry Service Resources	Environmental SAE
Reforestation Practices	NRS.03 Forest Sustainability	Reforestation Plan	State Forestry Resources	Natural Resources SAE
Safe Forest Management	NRS.03 Resource Stewardship	Forestry Safety Evaluation	Forestry Training Materials	Forestry Careers

Unit Assessment

- Forest Management Plan

Unit 11: Forest Products and Wood Utilization

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Forest Products and Uses	NRS.03 Resource Utilization	Forest Product Inventory	Forest Products Industry	Forestry SAE
Processing Forest Products	PST.01 Technical Systems Applications	Processing Investigation	Industry Resources	Wood Products SAE
Wood Characteristics	PST.01 Material Science Principles	Wood Identification Lab	Wood Technology Guides	Agricultural Mechanics SAE

Unit Assessment

- Forest Products Portfolio

Unit 12: Wildlife Conservation and Environmental Resources Capstone

Length: 15 Days

Course Competency	AFNR Performance Indicator	Sample Measurement	Teacher Resources	SAE/FFA Connection
Wildlife Conservation	NRS.04 Wildlife Resource Management	Conservation Project	Wildlife Agencies	Wildlife SAE
Species Endangerment	ESS.01 Ecosystem Relationships	Endangered Species Report	Conservation Organizations	Research SAE
Food Chain and Natural Selection	ESS.01 Ecological Principles	Ecosystem Analysis	Biology Resources	Agriscience SAE
Wildlife Habitat Management	NRS.04 Habitat Conservation	Habitat Improvement Plan	NRCS Resources	Conservation SAE

Capstone Assessment

Students develop and present a complete **Applied Agriculture Science Portfolio** including:

1. Agricultural Issues Investigation
2. Animal Health Management Plan
3. Livestock Facility Design
4. Greenhouse Management Project
5. Nursery Production Record
6. Fruit or Vegetable Production Project

7. Landscape Design Portfolio
8. Forest Management Plan
9. Wildlife Conservation Project
10. SAE Documentation and Reflection

SAE Backbone Model

Quarter	SAE Milestone
Q1	Select and establish animal, horticulture, forestry, or wildlife SAE
Q2	Develop production, management, and recordkeeping skills
Q3	Expand applied science and technical management competencies
Q4	Complete capstone project and SAE portfolio

End Goal

Every student completes a documented SAE while gaining advanced competencies in:

- Animal Health Management
- Livestock Production Systems
- Greenhouse Management
- Nursery Production
- Landscape Design

- Forestry Management
- Wildlife Conservation
- Agricultural Marketing
- Environmental Stewardship

This course serves as New Mexico's applied AFNR science course connecting classroom science, laboratory experiences, SAE development, and career preparation across multiple AFNR pathways.