**New Mexico Agriculture, Food & Natural Resources Course Framework**

**Greenhouse / Nursery Operations (0143)**

**Suggested Course Length:** 180 Days

**AFNR Pathway:** Plant Systems (PS), Agribusiness Systems (ABS), Power, Structural & Technical Systems (PST)

**Prerequisite:** Agricultural Science (0132) Recommended

**Instructional Design Philosophy**

Greenhouse/Nursery Operations is an advanced plant systems course focused on greenhouse production, plant propagation, nursery crop production, greenhouse technology, business management, and horticultural entrepreneurship. Students gain hands-on experience operating a greenhouse or nursery while applying scientific principles to plant production and business management.

**The SAE serves as the backbone of instruction.** Students should develop and maintain a greenhouse production, nursery management, plant propagation, landscape, floriculture, or horticultural entrepreneurship SAE. Every unit contributes to the operation of a school greenhouse or nursery enterprise and culminates in a comprehensive greenhouse business portfolio.

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**Course-at-a-Glance**

| Quarter | Units | Days |
|---|---|---|
| Q1 | Units 1-3 | 45 |
| Q2 | Units 4-6 | 45 |
| Q3 | Units 7-9 | 45 |
| Q4 | Units 10-12 | 45 |

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**Unit 1: Introduction to Greenhouse and Nursery Industries**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Greenhouse Industry Overview | PS.01 Plant Production Systems | Industry Analysis Report | MyCAERT, SAF Resources | Exploratory Horticulture SAE |
| Nursery Industry Overview | PS.01 Plant Industry Applications | Nursery Investigation | NMSU Extension | Plant Systems SAE |
| Career Opportunities | CRP.01 Career Planning & Management | Career Portfolio | AgCareers | Nursery/Landscape Proficiency |

**Unit Assessment**

- Greenhouse Industry Report
- Career Exploration Portfolio

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**Unit 2: Plant Propagation Fundamentals**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Sexual Propagation | PS.03 Plant Reproduction | Seed Germination Lab | Greenhouse Curriculum | Plant Production SAE |
| Propagation by Cuttings | PS.03 Plant Reproduction Techniques | Rooting Project | Propagation Manuals | Entrepreneurship SAE |
| Division, Separation, and Layering | PS.03 Plant Propagation Methods | Propagation Comparison Study | Industry Resources | Greenhouse Production SAE |

**Unit Assessment**

- Plant Propagation Portfolio
- Propagation Practicum

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**Unit 3: Advanced Plant Propagation**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Grafting Techniques | PS.03 Advanced Plant Propagation | Grafting Demonstration | Nursery Production Guides | Fruit Production SAE |
| Budding Techniques | PS.03 Plant Improvement Methods | Budding Project | Orchard Resources | Horticulture SAE |
| Tissue Culture | BS.03 Biotechnology Applications | Tissue Culture Investigation | CASE Biotechnology | Research SAE |

**Unit Assessment**

- Propagation Skills Practicum
- Plant Propagation Portfolio

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**Unit 4: Growing Media and Plant Nutrition**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Growing Media Properties | PS.01 Plant Growth Factors | Media Analysis Lab | Greenhouse Textbooks | Greenhouse SAE |
| Growing Media Components | PS.01 Soil and Media Systems | Media Formulation Project | Industry Suppliers | Nursery Production SAE |
| Plant Nutrition | PS.01 Nutrient Management | Fertility Plan | Extension Publications | Crop Production SAE |

**Unit Assessment**

- Growing Media Portfolio
- Fertility Management Project

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**Unit 5: Hydroponics and Controlled Environment Agriculture**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Understanding Hydroponics | PS.04 Controlled Environment Agriculture | Hydroponic System Evaluation | Hydroponics Curriculum | Hydroponics SAE |
| Nutrient Management Systems | PS.04 Production Technology | Nutrient Monitoring Project | Industry Resources | Specialty Crop SAE |
| Controlled Environment Production | PS.04 Plant Production Technologies | Growth Comparison Study | Greenhouse Industry Resources | Entrepreneurship SAE |

**Unit Assessment**

- Hydroponic Production Project

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**Unit 6: Greenhouse Structures and Climate Control**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Greenhouse Structures | PS.04 Greenhouse Systems | Greenhouse Evaluation | Structure Manufacturers | Greenhouse Operations SAE |
| Environmental Control Systems | PS.04 Climate Management | Climate Control Plan | Greenhouse Resources | Plant Production SAE |
| Greenhouse Climate Management | PS.04 Environmental Monitoring | Environmental Data Report | Greenhouse Sensors | Agriscience SAE |

**Unit Assessment**

- Greenhouse Systems Portfolio

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**Unit 7: Greenhouse Automation and Technology**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Automated Systems | PST.05 Technology Applications | Automation Analysis | Greenhouse Technology Resources | Technology SAE |
| Environmental Monitoring | PST.05 Monitoring Systems | Sensor Evaluation | Industry Vendors | Agriscience Research SAE |
| Greenhouse Data Management | PST.05 Precision Technologies | Data Collection Project | Greenhouse Software | Research SAE |

**Unit Assessment**

- Greenhouse Technology Project

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**Unit 8: Nursery Production and Crop Management**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Nursery Production Facilities | PS.01 Plant Production Facilities | Nursery Evaluation | Nursery Industry Resources | Nursery SAE |
| Producing Nursery Crops | PS.01 Plant Production Systems | Crop Production Record | Production Guides | Entrepreneurship SAE |
| Packaging Nursery Crops | ABS.01 Product Marketing Principles | Product Packaging Project | Industry Examples | Retail Nursery SAE |

**Unit Assessment**

- Nursery Production Portfolio

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**Unit 9: Equipment and Facility Maintenance**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Using Hand Tools | PST.01 Technical Skills | Tool Identification Practicum | Tool Manufacturers | Placement SAE |
| Power Tools and Equipment | PST.01 Equipment Operation | Equipment Safety Assessment | Equipment Manuals | Nursery Operations SAE |
| Maintaining Small Engines | PST.02 Equipment Maintenance | Small Engine Service Project | Briggs & Stratton Resources | Agricultural Mechanics SAE |

**Unit Assessment**

- Equipment Skills Practicum

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**Unit 10: Nursery Business Management**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Managing the Nursery Business | ABS.01 Business Operations | Nursery Management Plan | SBA Resources | Entrepreneurship SAE |
| Human Relations in the Workplace | CRP.03 Professionalism & Teamwork | Customer Service Evaluation | Industry Resources | Placement SAE |
| Communication Skills | CRP.04 Communication Skills | Customer Communication Activity | FFA Leadership Resources | Sales SAE |

**Unit Assessment**

- Nursery Management Portfolio

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**Unit 11: Marketing Greenhouse and Nursery Products**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Selecting a Marketing Approach | ABS.01 Marketing Principles | Marketing Analysis | Marketing Templates | Entrepreneurship SAE |
| Developing a Marketing Plan | ABS.01 Marketing Strategy | Marketing Plan Development | SCORE, SBA Resources | Greenhouse Enterprise SAE |
| Advertising and Displaying Products | ABS.01 Product Promotion | Advertising Campaign | Canva, Industry Examples | Nursery Sales SAE |

**Unit Assessment**

- Greenhouse Marketing Plan

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**Unit 12: Horticulture Entrepreneurship Capstone**

**Length:** 15 Days

| Course Competency | AFNR Performance Indicator | Sample Measurement | Teacher Resources | SAE/FFA Connection |
|---|---|---|---|---|
| Establishing a Horticulture Business | ABS.01 Business Development | Business Plan | SBA Business Builder | Entrepreneurship SAE |
| Financial Management | **ABS.02.02.01.b** Prepare financial reports to describe AFNR business performance. [2024 AFNR...e Document \| PDF] | Startup Budget | Farm Credit Resources | Greenhouse Enterprise SAE |
| Recordkeeping | **ABS.02.01.01.a** Describe accounting systems and procedures used for recordkeeping. [2024 AFNR...e Document \| PDF] | Financial Record Book | AET | Degree Applications |
| Marketing and Sales | ABS.01 Marketing & Customer Relations | Sales Portfolio | Industry Mentors | Nursery Sales SAE |

**Capstone Assessment**

Students develop and present a complete **Greenhouse/Nursery Enterprise Portfolio** including:

1. Greenhouse Production Plan
2. Plant Propagation Portfolio
3. Growing Media Analysis
4. Hydroponics Project
5. Climate Management Plan

6. Nursery Production Records
7. Marketing Plan
8. Business Plan
9. Financial Records and Budget
10. SAE Documentation and Presentation

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**SAE Backbone Model**

| Quarter | SAE Milestone |
|---|---|
| Q1 | Establish greenhouse or nursery SAE and begin propagation records |
| Q2 | Develop production, nutrition, and greenhouse management skills |
| Q3 | Operate greenhouse systems and manage crop production |
| Q4 | Develop business plans, marketing strategies, and enterprise records |

**End Goal**

Every student completes a documented Greenhouse, Nursery Production, Plant Propagation, Hydroponics, Floriculture, Landscape, or Horticultural Entrepreneurship SAE while developing competencies in:

- Plant Propagation
- Greenhouse Production
- Hydroponics
- Nursery Management

- Greenhouse Technology
- Plant Nutrition
- Business Management
- Marketing and Sales
- Entrepreneurship

This course serves as New Mexico's primary Greenhouse and Nursery Operations pathway course and aligns naturally with Floriculture CDE, Nursery/Landscape CDE, Agriscience Fair projects, and horticultural entrepreneurship opportunities.