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PROGRAM CONCENTRATION: Agriculture
CAREER PATHWAY: Horticulture/Plant Science
COURSE TITLE: Floriculture Production and Management

This course is designed to introduce students to the principles and practices of floriculture production. Students will develop floriculture skills and the basic understanding necessary to be successful in entry-level positions in the floriculture industry. Classroom and laboratory activities are supplemented through supervised agricultural experiences and leadership programs and activities.

AG-FL-1. Students will become oriented to the comprehensive program of agricultural education, learn to work safely in the agriculture lab and work sites, demonstrate selected competencies in leadership through the FFA and agricultural industry organizations, and develop plans for a supervised agricultural experience (SAE) program.

- a. Explain the role of the Agricultural Education program and the FFA in personal development.
- b. Demonstrate knowledge learned through a Supervised Agricultural Experience (SAE) program.
- c. Develop leadership and personal development skills through participation in the FFA.
- d. Explore career opportunities in floriculture through the FFA and Agricultural Education Program.
- e. Explore the professional agricultural organizations associated with the course content.

Academic Standards:

MM1P3. Students will communicate mathematically.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SCSh8. Students will understand important features of the process of scientific inquiry.

ELA9RC2. The student participates in discussions related to curricular learning in all subject areas.

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ELA9W4. The student practices both timed and process writing and, when applicable, uses the writing process to develop, revise, and evaluate writing.

ELA9LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

AG-FL-2. Students will explore the floriculture industry and become oriented to the basics of floriculture science, production and distribution.

- a. Describe the scope and importance of the floriculture industry.
- b. List and describe careers in floriculture.

Academic Standards:

SSEM12. The student will explain how the Law of Demand, the Law of Supply, prices, and profits work to determine production and distribution in a market economy.

SSEM13. The student will explain how markets, prices, and competition influence economic behavior.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

ELARC2. The student participates in discussions related to curricular learning in all subject areas.

AG-FL-3. Students will compare and contrast the structure and parts of floriculture plants.

- a. Identify the primary parts of a plant and their functions.
- b. Label parts of monocot and dicot vascular systems.
- c. Describe types of root systems.
- d. Compare and contrast complete and incomplete flowers.

Academic Standards:

SB1. Students will analyze the nature of the relationships between structures and functions in living cells.

SB2. Students will analyze how biological traits are passed on to successive generations.

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SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

ELA9-12RC3. The student acquires new vocabulary in each content area and uses it correctly.

AG-FL-4. Students will explain how plants grow and describe factors that affect plant growth.

- a. Describe the processes of photosynthesis and factors that affect photosynthesis in plants.
- b. Describe the processes of respiration and factors that affect respiration in plants.
- c. Identify cultural and environmental factors that affect plant growth.
- d. Define photoperiodism and factors that affect the process.
- e. Identify the purpose and use of growth regulators.
- f. Demonstrate methods for controlling plant growth.

Academic Standards:

SB1. Students will analyze the nature of the relationships between structures and functions in living cells.

SB4. Students will assess the dependence of all organisms on one another and the flow of energy and matter within their ecosystems.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

ELA9-12RC3. The student acquires new vocabulary in each content area and uses it correctly.

AG-FL-5. Students will understand and apply scientific nomenclature for plants.

- a. Distinguish between genus, species, cultivar, and common names.
- b. Define common taxonomic terms.
- c. Identify common floriculture plants by common and scientific names.
- d. Demonstrate the use of a plant key.

Academic Standards:

MM1A3. Students will solve simple equations.

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SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

ELA9-12RC3. The student acquires new vocabulary in each content area and uses it correctly.

ELA9-12RC4. The student establishes a context for information acquired by reading across subject areas.

AG-FL-6. Students will explore the factors that should be considered in the planning and construction of a home or commercial greenhouse.

- a. Identify optimal greenhouse locations.
- b. Calculate greenhouse space requirements.
- c. Explain the types of greenhouse structures.
- d. Identify the major glazing used on greenhouses.
- e. Describe the characteristics of materials used to frame a greenhouse.
- f. Diagram commonly used greenhouse layouts and bench arrangement.

Academic Standards:

MM1A3. Students will solve simple equations.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SEV5. Students will recognize that human beings are part of the global ecosystem and will evaluate the effects of human activities and technology on ecosystems.

ELA9-12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

AG-FL-7. Students will explore, prescribe and apply greenhouse environmental control specifications.

- a. Identify the types and uses of irrigation systems.
- b. Prescribe proper irrigation specifications for greenhouse crops.

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- c. Analyze the problems associated with poor soil drainage and salt build-up.
- d. Describe proper greenhouse temperature control and its importance to plant health.
- e. Identify areas in the greenhouse prone to heat loss.
- f. Identify heating sources for greenhouse crops.
- g. Identify the importance and methods of greenhouse ventilation.
- h. Identify and prescribe methods of shading greenhouses.

Academic Standards:

MM1G1. Students will investigate properties of geometric figures in the coordinate plane.

MM1A3. Students will solve simple equations.

MM1G3. Students will discover, prove, and apply properties of triangles, quadrilaterals, and other polygons.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

AG-FL-8. Students will explore the use of floriculture growing media and the factors that affect the use of each type of media and soil/media component.

- a. Compare and contrast the various types and components of floriculture crop growth media.
- b. Identify common growth media components in soil mixtures and their uses in the industry.
- c. Calculate growing media requirements and formulations for floriculture crop production.

Academic Standards:

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

ELA9-12RC3. The student acquires new vocabulary in each content area and uses it correctly.

AG-FL-9. Students will explore the factors that influence container selection and application in floriculture.

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- a. Identify the most common materials and container types used in floriculture.
- b. Select suitable containers for selected crop and growing media.
- c. Identify marketing characteristics of containers and the influence on floriculture plant sales.
- d. Calculate container needs and costs for floriculture corps.

Academic Standards:

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials..

AG-FL-10. Students will demonstrate knowledge of the process of sexual plant reproduction and apply commonly used floriculture principles and practices in sexual plant propagation.

- a. Identify and describe the characteristics of sexual propagation.
- b. Identify biological components and functions of a seed.
- c. Demonstrate the steps in germination in common floriculture seed germination processes.
- d. Identify methods of seeding in floriculture.
- e. Demonstrate scarification and stratification techniques.
- f. Demonstrate transplanting methods and seedling care.
- g. Demonstrate proper handling, storage, and care of seed.

Academic Standards:

MM1D2. Students will use the basic laws of probability.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

ELA9-12RC3. The student acquires new vocabulary in each content area and uses it correctly.

ELA9-12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

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AG-FL-11. Students will explore the knowledge and skills necessary to propagate plants through various methods of asexual reproduction.

- a. Identify factors that affect the selection, application, and economic feasibility of various asexual propagation methods.
- b. Identify and put into practice methods of asexual propagation for greenhouse crops (cuttings, division, separation, layering).

Academic Standards:

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

ELA9-12RC3. The student acquires new vocabulary in each content area and uses it correctly.

AG-FL-12. Students will evaluate and develop an understanding of the nutritional needs of plants.

- a. Identify and categorize the essential elements needed for plant health and economic floriculture crop production.
- b. Evaluate the availability of nutrients in floriculture plant growing media.
- c. Apply the principles and practices of soil pH to adjust growing media pH as necessary.

Academic Standards:

ELA9-12RC3. The student acquires new vocabulary in each content area and uses it correctly.

ELA9-12LSV1. The student participates in student-to-teacher, student-to-student, and group verbal interactions.

AG-FL-13. Students will explore the use of basic chemicals and application practices in floriculture in a safe, legal, and economically sound manner.

- a. Explain the importance of chemical safety.
- b. Demonstrate safe chemical practices and the use of protective gear in chemical application.
- c. Compare and contrast chemical control to alternative treatment methods and materials in floriculture production.
- d. Procure and interpret MSDS (Material Safety Data Sheets) for floriculture

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- chemicals.
- e. Calculate and mix chemicals for application to floriculture crops.

Academic Standards:

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

SC5. Students will understand that the rate at which a chemical reaction occurs can be affected by changing concentration, temperature, or pressure and the addition of a catalyst.

SC7. Students will characterize the properties that describe solutions and the nature of acids and bases.

AG-FL-14: Students will identify plant nutrient needs and prescribe the use of fertilization materials and methods for floriculture crops.

- a. Identify forms of fertilizers and their advantages and disadvantages.
- b. Demonstrate proper fertilization mixing methods.
- c. Identify application methods for fertilizers to plants.
- d. Calculate fertilizer rates and cost and select and prescribe fertilizer applications.
- e. Identify conditions for storing fertilizers.
- f. Interpret MSDS for fertilizers.

Academic Standards:

MM1P3. Students will communicate mathematically.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

SC5. Students will understand that the rate at which a chemical reaction occurs can be affected by changing concentration, temperature, or pressure and the addition of a catalyst.

SC7. Students will characterize the properties that describe solutions and the nature of acids and bases.

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AG-FL-15. Students will identify plant pests, pest control practices and prescribe the use of cultural, biological, and chemical materials and methods to protect floriculture crops.

- a. Identify greenhouse pests and explain their life cycles and biological nature related to pest control.
- b. Analyze, estimate, and predict damage to greenhouse crops from pests.
- c. Compare and contrast different types of management approaches to control floriculture pests.
- d. Explain the concepts of integrated pest management.

Academic Standards:

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

ELA9-12RC3. The student acquires new vocabulary in each content area and uses it correctly.

AG-FL-16. Students will practice floriculture crop management skills and apply cultural principles and practices of the floriculture industry.

- a. Identify and classify greenhouse crops.
- b. Determine the growing space for a given crop.
- c. Calculate a production schedule for a given crop.
- d. Prepare, prescribe and apply cultural practices for given floriculture crops.
- e. Develop production records and a product inventory.
- f. Judge the effectiveness of various floriculture practices under various conditions and specified crops.

Academic Standards:

MM1D1. Students will determine the number of outcomes related to a given event.

MM1P1. Students will solve problems (using appropriate technology).

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SCSh3. Students will identify and investigate problems scientifically.

AG-FL-17. Students will explore the use of floral design skills in the

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preparation, presentation, and marketing of floriculture crops.

- a. Evaluate the economic value and importance of the floral design industry.
- b. Demonstrate the construction and application of floral items and techniques, such as bow construction.
- c. Demonstrate skills in the preparation of potted plants for sale.
- d. Apply basic floral skills in the production of floral designs and other items for sale, such as bud vases, corsages, and centerpieces.

Academic Standards:

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SSEM12. The student will explain how the Law of Demand, the Law of Supply, prices, and profits work to determine production and distribution in a market economy.

SSEM13. The student will explain how markets, prices, and competition influence economic behavior.

AG-FL-18. Students will describe the importance of applying good business management and customer service techniques to the floriculture industry.

- a. Calculate production and wholesale costs, retail value, and profit.
- b. Identify and practice good salesmanship techniques.
- c. Identify, prescribe, and practice good marketing strategies for floriculture crops.

Academic Standards:

MM1A1. Students will explore and interpret the characteristics of functions, using graphs, tables, and simple algebraic techniques.

MM1A3. Students will solve simple equations.

MM1P3. Students will communicate mathematically.

MM1P4. Students will make connections among mathematical ideas and to other disciplines.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

SSEM12. The student will explain how the Law of Demand, the Law of Supply, prices, and profits work to determine production and distribution in a market economy.

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SSEM13. The student will explain how markets, prices, and competition influence economic behavior.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Education Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and postsecondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety,

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health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.