# Horticulture, Floriculture & Greenhouse Management Course No. 18057 Credit: 1.0

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| --- | --- | --- | --- |
| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes: **Plant Science and Industry Operations (01.1101).**

Course Description: Plant Identification and floral design are necessary knowledge skills along with the selection of greenhouse plants and management of greenhouses for production of plants and flowers in the industry

Special Note: The AFNR College and Career Ready Skills are to be taught throughout the course utilizing FFA and SAE programming found at the Kansas Ag Ed website. Specific activities may be found in the SAE for All Teachers Guide and at National FFA.org. The AFNR College and Career Ready Skills competencies can be found at Kansas Ag Ed.

Opportunities in Agriculture Education & FFA:Classroom and laboratory instruction integrates and/or is supplemented by experiential, project, and leadership and personal development through FFA .Students should be introduced to FFA through leadership activities and College and Career Ready Skills. Specific FFA information and activities may be found in the “National FFA Student Handbook, 16thedition”. Student activities, scoring rubrics, grading examples, and teacher lessons are all found in the “FFA Student Handbook Teachers Guide”. Additional information can be found at [www.ffa.org](http://www.ffa.org/).

Workplace Skills, Supervised Agricultural Experience and Record Keeping: Classroom and laboratory instruction integratesand/or is supplemented by experiential, project, and work based learning through SAE. Specific SAE activities that support the College and Career Ready Skills may be found in the “SAE for All Guide”. Students should be introduced to Foundational SAE’s and the AET student portfolio system. Student activities, scoring rubrics, grading examples, and teacher lessons are all found in the “SAE for All Teachers Guide”. Additional information is found in the SAE Individual Learning Guides and Teacher Editions and in the AFNR College and Career Ready Competency Profile found at *Kansas Ag* *Ed.*

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Career Opportunities

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Identify various careers in floriculture, nursery, and greenhouse operations.  |  |
| 1.2 | Summarizes different educational requirements. |  |
| 1.3 | Discuss global perspectives in the floriculture, nursery, and greenhouse operation industries. |  |

## Benchmark 2: Safety

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Identify tools used in floriculture, nursery, and greenhouses.  |  |
| 2.2 | Demonstrate correct use of hand and power tools.  |  |
| 2.3 | Demonstrate safe use of plant growth regulators.  |  |
| 2.4 | Be aware of electrical hazards and water in the greenhouse.  |  |

## Benchmark 3: Plant Identification & Classification

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Use scientific plant names to correctly. |  |
| 3.2 | Describe various plant organs and how they are used for classifying plants. |  |
| 3.3 | Describe plants using taxonomic terms.  |  |
| 3.4 | Identify 20 plants commonly found in a nursery, greenhouse, or floral shop. |  |

## Benchmark 4: Greenhouse Structures

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Categorize the different types of greenhouse structures, the various components of a greenhouse, and the glazing materials used to cover a greenhouse.  |  |
| 4.2 | Interpret the economic factors to be considered in constructing a greenhouse. |  |
| 4.3 | Calculate operation costs and greenhouse structure costs.  |  |
| 4.4 | Determine location and orientation of greenhouses.  |  |
| 4.5 | Identify different types of benches.  |  |
| 4.6 | Discuss environmental controls (heating, cooling, air circulation, lighting, and humidity). |  |
| 4.7 | Differentiate between different irrigation and watering systems. |  |
| 4.8 | Design and layout a greenhouse facility to obtain maximum production and efficient use. |  |

## Benchmark 5: Plant Media & Growing Containers

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Explain the components of a soil-less media. |  |
| 5.2 | Prepare and grow plants in a soil-less media . |  |
| 5.3 | Design greenhouse mediums to fit various plant needs. |  |
| 5.4 | Calculate soil amounts for different pots.  |  |
| 5.5 | Sterilize (pasteurize) growing media. |  |
| 5.6 | Identify basic types and sizes of containers used in commercial greenhouses.  |  |

## Benchmark 6: Greenhouse Cultural Practices

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | Explain how environmental factors may be managed for better plant performance. |  |
| 6.2 | Compare how physiological processes are manipulated for plant productivity and quality. |  |
| 6.3 | Identify different light requirements for different greenhouse crops.  |  |
| 6.4 | Compare and contrast methods used to provide artificial long- and short-day conditions. |  |
| 6.5 | Determine different temperature requirements for different greenhouse crops.  |  |
| 6.6 | Summarize temperature effects on photosynthesis, plant respiration, plant transpiration, flower bud initiation and development, and flower color. |  |
| 6.7 | Explain different types of heating units for greenhouses and calculate the heat requirements for a greenhouse. |  |
| 6.8 | Describe humidity requirements for different greenhouse crops.  |  |
| 6.9 | Identify factors that promote good air quality in a greenhouse. |  |
| 6.10 | Determine the amount of water needed for common greenhouse crops.  |  |
| 6.11 | Develop a watering schedule for a greenhouse. |  |
| 6.12 | Determine plant growing conditions for greenhouses, hydroponics, and natural settings and set planting and care schedules. |  |
| 6.13 | Explain the importance of genetics in horticultural plant improvement. |  |

## Benchmark 7: Greenhouse Management

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 7.1 | Propagate plants sexually and asexually.  |  |
| 7.2 | Calculate fertigation requirements.  |  |
| 7.3 | Calculate bench space for different sizes of pots.  |  |
| 7.4 | Regulate pH in soil and water.  |  |

## Benchmark 8: Greenhouse Production

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 8.1 | Demonstrate bedding plant production methods.  |  |
| 8.2 | Design or develop a greenhouse planting schedule.  |  |
| 8.3 | Analyze the greenhouse plant production areas and the top sales state by plant type.. |  |
| 8.4 | Learn proper technique for poinsettia, Easter lily, and Chrysanthemum production.  |  |
| 8.5 | Learn hydroponic methods of plant production.  |  |

## Benchmark 9: Integrated Pest Management

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 9.1 | Identify common pests and diseases in Kansas greenhouses.  |  |
| 9.2 | Describe control methods, sanitation, chemical formulations, and equipment used to control pests in the greenhouse.  |  |
| 9.3 | Identify safety guidelines for pesticide use.  |  |
| 9.4 | Read chemical label and use the chemical properly. |  |
| 9.5 | Dispose of chemicals according to EPA recommendations. |  |
| 9.6 | Design and Implement an Integrated Pest Management Plan for a greenhouse. |  |

## Benchmark 10: Perform basic principles and elements of floral design

### Competencies

| **#** | **Description** | **rating** |
| --- | --- | --- |
| 10.1 | List and define the principles and elements of design. |  |
| 10.2 | Identify basic design shapes. |  |
| 10.3 | Identify color relationships.  |  |
| 10.4 |  Identify the origins of floral designs. |  |

## Benchmark 11: Discuss the necessary mechanics of floral design

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 11.1 | Identify and safely use design tools and supplies.  |  |
| 11.2 | Tie attractive bows for corsages, wreaths, and flower arrangements.. |  |
| 11.3 | Select and prepare appropriate containers.  |  |
| 11.4 | Perform basic wiring and taping techniques.  |  |
| 11.5 | Package flowers and arrangements for delivery.  |  |
| 11.6 | Select cut flowers and greens for an arrangement. |  |
| 11.7 | Process a shipment of cut plant materials to extend the shelf life of the plant. |  |

## Benchmark 12: Demonstrate creation of a variety of floral designs

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 12.1 | Identify how floral designs are used.  |  |
| 12.2 | Construct corsages and boutonnieres.  |  |
| 12.3 | Construct a bud vase.  |  |
| 12.4 | Construct a one sided arrangement.  |  |
| 12.5 | Construct a centerpiece.  |  |
| 12.6 | Construct a circular arrangement. |  |
| 12.7 | Construct a triangular arrangement. |  |
| 12.8 | Construct a line arrangement. |  |
| 12.9 | Construct an evergreen wreath. |  |
| 12.10 | Construct a silk arrangement.  |  |
| 12.11 | Construct a dried arrangement. |  |
| 12.12 | Construct a dish garden.  |  |
| 12.13 | Critique an arrangement using a rating scale based on the principles of design. |  |

## Benchmark 13: Nursery & Landscape Industry

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 13.1 | Identify the common elements of landscape plans and describe the purpose of each. |  |
| 13.2 | State the purpose of the drawing scale and identify two methods to indicate the scale. |  |
| 13.3 | Describe what the architect’s, engineer’s and metric measuring scales are used for and the differences between the three scales and take measurements using each scale. |  |
| 13.4 | Use various formulas to calculate and estimate quantities of landscape materials. |  |
| 13.5 | Define and give examples of hardscapes used in the landscape. |  |
| 13.6 | Describe factors to consider when planning a water feature in a landscape. |  |
| 13.7 | List and describe environmental conditions to consider when selecting plants for a site. |  |
| 13.8 | Identify 50 plants used in a residential landscape in your immediate area. |  |
| 13.9 | List and describe factors concerning maintenance, intended use, site conditions and appearance, to be considered when selecting a grass species. |  |
| 13.10 | Properly demonstrate four types of equipment used in landscape construction. |  |
| 13.11 | Create a landscape drawing to scale for a landscape project. |  |
| 13.12 | Create an estimate for a landscape project including mark-up, labor, and product. |  |

## Benchmark 14: Click or tap here to enter text.

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 14.1 | Calculate the price for floral arrangements. |  |
| 14.2 | Calculate prices for different sizes of potted plants.  |  |
| 14.3 | Calculate prices for a nursery landscape project. |  |
| 14.4 | Understand financial records for floriculture, nursery, and greenhouse operations.  |  |
| 14.5 | Understand advertising and marketing for floriculture, nursery, and greenhouse operations.  |  |
| 14.6 | Determine types and quantities of horticultural plants to be grown, based on budgets, projected sales volumes, or executive directives. |  |
| 14.7 | Set sale prices for floriculture, nursery, and greenhouse operations. |  |
| 14.8 | Market products for floriculture, nursery, and greenhouse operations. |  |
| 14.9 | Prepare a business plan for a floriculture, nursery, or greenhouse operation. |  |
| 14.10 | Demonstrate appropriate customer relations skills.  |  |

## Benchmark 15: Opportunities in agriculture education & FFA

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 15.1 | Classroom and laboratory instruction integrates and/or is supplemented by experiential, project, and leadership and personal development through FFA. Students should be introduced to FFA through leadership activities and College and Career Ready Skills. Specific FFA information and activities may be found in the “National FFA Student Handbook, 16th edition”. Student activities, scoring rubrics, grading examples, and teacher lessons are all found in the “FFA Student Handbook Teachers Guide”. Additional information can be found at www.ffa.org. |  |

## Benchmark 16: Work Place Skills, Supervised Agricultural Experience and Record Keeping

### Competencies

| **#** | **Description** | **Rating** |
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I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

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