Russellville High School

Agriscience Education
Plant Systems Program

Course Syllabus
for
Horticulture

Instructor – Mr. Nichols

01/04/17

Course Description

Horticulture is a one-credit course in which students receive instruction about this multi-faceted industry and participate in hands-on activities in the areas of career opportunities, safety, plant physiology, growing media, greenhouse facilities, greenhouse and nursery crop production, plant identification and classification, pest management, hydroponics and vegetable gardening, and technological applications

Content standards for this course are not intended to serve as the entire curriculum. Teachers are encouraged to expand the curriculum beyond the limits of these content standards to accommodate specific community interests and utilize local resources. This course encourages critical thinking, use of the scientific method, integration of technology, development of student leadership skills, and application of knowledge and skills related to practical questions and problems. Safety concepts are integrated into instruction to the maximum extent possible.

Career and technical student organizations are integral, co-curricular components of each career and technical education course. These organizations serve as a means to enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for personal and professional growth.

Course Goals

This course encourages critical thinking skills, use of the scientific method, integration of technology, development of student leadership skills, and application of knowledge and skills related to practical questions/problems. Safe field and laboratory investigations should be used in instruction to maximum extent possible to illustrate scientific concepts and principles and to support inquiry instruction.

This course emphasizes SAEP and FFA opportunities that develop students' potential for premier leadership, personal growth, and career success.

Career Technical Student Organization (CTSO): FFA

FFA is a dynamic youth organization that is an intra-curricular component of an agriscience program. FFA offers a variety of opportunities for members to get involved through leadership conferences, scholarship opportunities, and competitive events. The FFA Mission is to make a positive difference in the lives of young people by developing their potential for premier leadership, personal growth, and career success through agriscience education. To find out more about FFA, please visit www.alabamaffa.org or www.ffa.org.

Prerequisites

None

Essential Questions

1. How has the horticulture industry changed in America over the last 10 years?
2. What jobs are available to someone who is interested in the horticulture industry?
3. What are safety considerations and procedures in the horticultural industry?
4. What are plant growth regulators and what are their functions?
5. What effect does growing media have on plant growth?
6. How are plant nutrients classified?
7. What considerations need to be addressed for greenhouse frameworks?
8. What materials are used for greenhouse glazing?
9. What automated systems are used in watering plants?
10. What is a sample field practice schedule?
11. How do you determine which plant follows which schedule?
12. Explain why common names are given to plants?
13. Explain the difference between genus, species, and variety?
14. What methods are used to manage insects?
15. What are the basic elements of an integrated pest management program?
16. What requirements must hydroponic systems meet in order for plants to grow?
17. What factors are considered in arranging vegetables and developing a garden plan?
18. What are the current technological advancements in the horticultural industry?

Credit

One Carnegie Unit

Student Fees

$25.00

Evaluation/Assessment

Student grades will be based on a variety of daily exercises averaged with their test scores on the individual units of instruction. Forty percent of the final grade per grading period (9 weeks) will be based on daily work to insure that students will have ample opportunity to maintain adequate course grades. Fifty percent of the grade will be based on test grades. Daily work will include but not be limited to objective exercises, class participation, group work, shop/lab projects, and other forms of assessment that promote higher order thinking skills. Ten percent of the final grade per grading period will be based on employability skills. Semester grades will be calculated according to the method approved by school administration which will include mid-term and final exam scores.

Grading Method:

Nine Weeks' Grade:

A. 10% Employability Skills
B. 40% Daily Work
C. 50% Tests

10% Employability Skills:

On the job, it is so important for you to be organized, to be able to follow directions, to be at work on time, to have good attendance, to keep neat work areas, and to maintain professional behavior. In an effort to help build these characteristics in each agriscience student, part of every nine weeks' grade will be "Employability Skills". Everyone begins each nine weeks with a grade of 100 for Employability Skills. It is so easy to keep the 100 and let this portion of your total grade help your average; or, you can lose points from this part of your grade and hurt your average for the following reasons:

1. Absence from class = -2 points per violation
2. Tardy to class = -2 points per violation
3. Coming to class without proper supplies = -2 points per violation
4. Failure to clean up your work area and leave it neat = -2 points per violation
5. Not remaining seated in assigned seat until the bell rings and do not stand at the door = -2 points per violation
6. Any disorderly conduct that interferes with our classwork = -2 points per violation
7. Not wearing all required safety equipment (PPE) = -2 points per violation
8. Returning to classroom from assigned lab area without permission = -5 points per violation
9. Repeated misbehavior will result in a **zero** employability grade

RHS Grading Scale

A = 90-100
B = 80-89
C = 70-79
F = 69 and below

Culminating Product(s)

The horticulture class will start plants from seeds, grow out plugs, learn to manage these in a greenhouse environment, and then will learn business skills while selling our finished product to the public during the month of April and into May.

1. Students will participate in Career Development Events and Personal S.A.E.
2. Students will design a safety program for working in the horticultural industry.
3. Students will design a schedule for applying plant growth regulators on the athletic field(s).
4. Students will design a schedule for applying fertilizer on the athletic fields according to soil test.
5. Students will make scale models of different greenhouse designs.
6. Students prepare a greenhouse and nursery crop production schedule.
7. Students can make an arboretum on campus for the school and community.
8. Students will outline a pest control program, which shall include biological control and include the point of chemical control.
9. Students will develop and draw to scale a vegetable garden plan to include proper plant and site selection.
10. Students will prepare PowerPoint presentations to explain the types of automated systems used in commercial greenhouses.

Available Student Industry Credential(s)

1. Landscape Management = CRI
2. Urban Forestry = CRI
3. Alabama Hunter Education Certification =Stackable credential
4. Junior Master Gardener in Plant Growth and Development
5. Junior Master Gardener in Soils and Water

For More Information on the Agriscience Program at Russellville High School Contact:

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No person shall be denied employment, be excluded from participation, be denied the benefits of, or subjected to discrimination in any program or activity on the basis of race, color, disability, sex, religion, national origin, or age by the Russellville City School System. Equal access shall be available to the Boy Scouts and other designated youth groups. The Superintendent, Heath Grimes, has been designated as the person coordinating the Russellville City Schools' effort to implement this non-discriminatory policy. If there are questions or concerns, contact him by phone at 331-2000, by e-mail at heath.grimes@rcs.k12.al.us ,or in writing at 1945 Waterloo Road, Russellville, AL 35653.

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Horticultural Science

Topics in Horticultural Science include career opportunities, safety, plant physiology, growing media, greenhouse facilities, greenhouse and nursery crop production, plant identification and classification, pest management, hydroponics and vegetable gardening, and technological applications.

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This course may be taught as a one-credit or half-credit course. For a half-credit course, content standards 1, 2, 3, 4, 5, 6, 7, 9, 13, 14, and 16 must be included.

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Career Opportunities

Students will:

1. Explain the importance of horticulture to local, state, national, and world economies.
2. Identify careers in horticulture.

Safety

3. Describe safety practices in horticulture.

Plant Physiology

4. Describe vegetative structures and functions in annuals, biennials, and perennials.
   Examples: root for plant anchor and support, stem for plant support, leaf for photosynthesis and respiration

   - Identifying sexual reproductive structures and functions of plants
     Examples: flower, fruit, seed
   - Identifying asexual reproductive structures and functions of plants
     Examples: stem, root, leaf

5. Describe the purpose and use of growth regulators.
   Examples: rooting, growth stimulant, retardant

Growing Media

6. Differentiate soil from soilless media in the horticulture industry.

7. Identify components of soil.
   Examples: sand, silt, clay

8. List macronutrients and micronutrients needed for plant growth.
   - Identifying the function of macronutrients and micronutrients
     Examples: major macronutrients—nitrogen, phosphorus, potassium
     secondary macronutrients—calcium, sulfur, magnesium
     micronutrients—zinc, iron, boron, copper, manganese, carbon, hydrogen, oxygen, molybdenum, chloride
   - Recognizing common nutrient deficiency symptoms

9. Design short- and long-term fertilization plans based on information provided by a soil test.
   - Comparing organic and inorganic fertilizers
   - Demonstrating fertilizer application methods
   - Describing pH modification procedures

Greenhouse Facilities

10. Describe various greenhouse designs and types of coverings.
    Examples: designs—even-span, Gothic arch, uneven-span, Quonset, lean-to, attached or gutter-connected
    coverings—glass, polyethylene, fiberglass, acrylic, polycarbonate

    - Comparing methods used in controlling greenhouse temperatures
      Examples: misting, heating, ventilating
    - Describing tables or benches used in greenhouses
      Examples: wood, welded wire, prefabricated plastic

Greenhouse and Nursery Crop Production

11. Design greenhouse and nursery crop production schedules.

12. Compare container and field nurseries.

13. Describe techniques for maintaining plants, including pruning, mulching, fertilizing, and irrigating.

Plant Identification and Classification

14. Identify common names of greenhouse and nursery plants.
    - Explaining the importance of the binomial classification system

Pest Management

15. Identify plant damage caused by insects.
    - Describing types of pesticides
      Examples: herbicides, miticides, insecticides, fungicides, rodenticides, molluscides, nematocides
    - Describing the Integrated Pest Management (IPM) concept
    - Identifying practices required in the safe use of pesticides

Hydroponics and Vegetable Gardening

16. Compare hydroponic systems used in the horticulture industry.
    Examples: sand culture, gravel culture, bag culture, aeroponic, continuous flow, nutrient film technique

17. Design a vegetable garden plan, including site and suitable plant varieties for the local area.

Technology Applications

18. Utilize various technologies in the horticulture industry.
    Examples: computers, computer software, watering timers, sensors