Plant and Soil Science

Course Description: Plant and soil science is designed to address issues dealing with the use of natural resources and agronomic crops as we see the need for improved management methods to meet the needs of agricultural production while addressing concerns dealing with urbanization and soil conservation.

Recommended Prerequisites: Agriscience or Principles of Agricultural Sciences

Recommended Credit: 1

Recommended Grade Level: 11th or 12th

Course Codes: **(2009-2010)** A10 – **5111** or A12 – **5161**
(2010-2015) A12 – **5161**

Plant and Soil Science

Standard 1.0

Evaluate conservation measures necessary for the use of natural resources for future generations.

Standard 2.0

Evaluate land management practices needed to ensure a plentiful supply of quality water.

Standard 3.0

Analyze the physical properties of soil and their relationship to plant growth.

Standard 4.0

Analyze the anatomy and physiology of plants that are used for agronomic crops.

Standard 5.0

Analyze the chemical elements essential to plant nutrition and the importance and benefits of proper soil fertility.

Standard 6.0

Evaluate the types of pollution in the environment and methods of controlling pollution.

Standard 7.0

Analyze factors used for selecting a site that ensures the optimal growth and economic return of agricultural crops.

Standard 8.0

Analyze factors that influence the economics of crop production.

Standard 9.0

Demonstrate premier leadership and personal growth needed for careers in the area of plant and soil science.

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Standard 1.0

Evaluate conservation measures necessary for the use of natural resources for future generations.

Learning Expectations and Performance Indicators:

1.1 Specify and explain terms related to natural resources and the environment.
1.2 Evaluate the economic impact of natural resources in agriculture.
1.3 Classify the major categories of natural resources.
1.4 Evaluate ways population growth and societal change affect natural resources.
1.5 Evaluate the role of individuals and organizations that work with conservation and the environment.

Standard 2.0

Evaluate land management practices needed to ensure a plentiful supply of quality water.

Learning Expectations and Performance Indicators:

2.1 Specify and explain terms related to water quality and land management.
2.2 Evaluate the management of surface water and the impact of water runoff on land use.
2.3 Determine the effects of groundwater on agricultural use.
2.4 Evaluate the types of agricultural wastes and techniques for reclamation.
2.5 Evaluate soil and water conservation needs.
2.6 Recommend soil management practices.
2.7 Summarize physical soil characteristics and their relationship to soil pollution.
2.8 Examine the relationship of soils and home site suitability.

Standard 3.0

Analyze the physical properties of soil and their relationship to plant growth.

Learning Expectations and Performance Indicators:

3.1 Specify and explain terms related to the physical properties of soils.
3.2 Compare soil particles, texture, drainage class, and rooting depth of a soil profile.
3.3 Determine land class based on soil characteristics.
3.4 Examine the effect of different slopes on soil erosion.
3.5 Evaluate the importance of organic matter in the soil.
3.6 Analyze soil formation and the development of the horizons in soil.

Standard 4.0

Analyze the anatomy and physiology of plants that are used for agronomic crops.

Learning Expectations and Performance Indicators:

4.1 Specify and explain terms related to plant anatomy and physiology of crops.
4.2 Explain the function of plant parts related to plant anatomy.
4.3 Explain the process of photosynthesis.
4.4 Explain the hydrologic cycle.
4.5 Explain the processes of sexual and asexual reproduction.
4.6 Distinguish between a monocot and dicot and their relationship in crop production.

Standard 5.0

Analyze the chemical elements essential to plant nutrition and the importance and benefits of proper soil fertility.

Learning Expectations and Performance Indicators:

5.1 Specify and explain terms related to soil chemistry and plant nutrition.
5.2 Evaluate the need for essential elements in plant growth.
5.3 Classify essential elements according to their sources.
5.4 Evaluate the nutritional needs of soil to promote plant growth.
5.5 Calculate the actual amount of nutrients found in bag analysis.
5.6 Differentiate between primary, secondary and micronutrients.
5.7 Measure soil pH and its effects on nutrient availability.
5.8 Assess the nutrient deficiency symptoms in plants.

Standard 6.0

Evaluate the types of pollution in the environment and methods of controlling pollution.

Learning Expectations and Performance Indicators:

6.1 Specify and explain terms related to environmental pollution control.
6.2 Evaluate sources of water pollution and methods of control.
6.3 Examine sources of air pollution and methods of control.
6.4 Examine sources of noise pollution and methods of control.
6.5 Analyze procedures for handling, storing and disposing of hazardous materials to protect the environment.
6.6 Examine the role of recycling and composting in controlling pollution.

Standard 7.0

Analyze factors used for selecting a site that ensures the optimal growth and economic return of agricultural crops.

Learning Expectations and Performance Indicators:

7.1 Specify and explain terms related to crop site selection.
7.2 Evaluate factors that affect site selection for agricultural crops.
7.3 Recommend best management practices that will ensure appropriate use of a land resource.
7.4 Analyze climatic factors that influence crop production.
7.5 Determine invasive pest species for row crop and non-row crop species using morphology. (i.e., plants, insects, animals)
7.6 Determine the crops that can be utilized for row crop production.
7.7 Determine the crops that can be utilized for small grain and forage production.
7.8 Determine the crops that can be utilized for vegetable production.
7.9 Determine the crops that can be utilized for fruit and nut production.

Standard 8.0

Analyze factors that influence the economics of crop production.

Learning Expectations and Performance Indicators:

8.1 Specify and explain terms related to crop economics.
8.2 Analyze input costs for the various types of crops.
8.3 Analyze the needs for different marketing strategies.
8.4 Examine the opportunities for specialty crops through niche markets.
8.5 Examine the economic and other advantages and disadvantages of using natural pests instead of pesticides
(i.e.,Intergrated Pest Management, IPM).

Standard 9.0

Demonstrate premier leadership and personal growth needed for careers in the area of plant and soil science.

Learning Expectations and Performance Indicators:

9.1 Specify and explain terms related to careers in plant and soil science.
9.2 Evaluate positive work attitudes and ethics used in natural resource management.
9.3 Prepare career plans that reflect critical thinking skills to encourage life-long learning.
9.4 Compare human relations skills used in dealing with landowners.
9.5 Prepare career goals, based on a related SAEP, supervised agricultural experience program, in natural resource management.