

Department:

Agriculture

Course Description:

This course will provide a study of the physical, chemical, and biological properties of soils and how these properties determine the nature of each soil and its crop productivity. The course will also cover soil management practices.

Course Competencies:

Upon completion of the course, the student should be able to:

1. Conduct a soil test for N, P, and K.
2. Collect and prepare a soil test for submission to a laboratory following approved methods by the American Soil Society.
3. Read the results from a soil analysis and interpret the results to make fertilizer recommendations for various crops.
4. Read a county soil survey map.
5. Identify the common soil types in the local or regional area.
6. Select lime sources using NEQ and CE values and software templates.

Course Content:

- A. The Development of Soils
 1. Historical soils and plant science
 2. Soil defined
 3. Soil factors for plant growth
 4. Soil formation
 5. Soil taxonomy
- B. Soil Physical Properties
 1. Soil texture
 2. Soil structure
 3. Particle density and bulk density
 4. Soil air
 5. Soil color and temperate
- C. Soil Colloids and Chemical Properties
 1. Soil clays
 2. Organic colloids
 3. Cation exchange
 4. Soil reactions (pH)
 5. Buffering in soils

- D. Soil Water
 - 1. Water retention forces
 - 2. Soil water reservoirs
 - 3. Estimating water contents
 - 4. Water flow through soils
 - 5. Water uptake in plants
- E. Soil Biology
 - 1. General classification of soil organisms
 - 2. Types
 - a. animalia
 - b. plantae
 - c. fungi
 - d. monera
 - e. others
- F. Organic Matter
 - 1. Composition of organic matter
 - 2. Benefits of organic matter
 - 3. Crop residues
 - 4. Animal manures
 - 5. Composts and composting
- G. Soil Nutrition
 - 1. Acidic soils and lime
 - 2. Nitrogen and phosphorus
 - 3. Potassium and sulfur
 - 4. Macro and micro nutrients
- H. Salt Affected Soils
 - 1. Causes of sodium in soils
 - 2. Disposal of excess salts
 - 3. Monitoring salt in fields
- I. Diagnosis of Soils and Fertilizer Recommendations
 - 1. Soils testing
 - 2. Soil sampling
 - 3. Soil tests and recommendations
- J. Soil Erosion and Sediment Control
 - 1. Nature of water erosion
 - 2. Factors affecting erosion by water
 - 3. Wind erosion
 - 4. Erosion control techniques

Learning Assessments:

Course competencies will be assessed by use of a pre-test, class exams and assignments, projects, lab work, quizzes, final exam, and a post-test.

Instructional Materials:

Textbook: Elements of the Nature and Properties of Soils, Brady.
Soils Lab Manual, Hawk.
Handouts.

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

On-Campus Students: At enrollment, any on campus student may complete a form that will allow them to self-identify any disability.

Off-Campus Regional Students: Self-identify your disability and accommodation needs with the Regional Coordinator and/or instructor, preferably prior to the first class meeting.

Online Students: Self-identify your disability and accommodation needs by contacting the Disabilities Coordinator. Students must provide their own programs to allow accessibility on their home computer.

Any student may also identify their disability by completing an online form located on the HCC homepage under Students Services/Resources/Disabilities. Questions should be directed to the Disabilities Coordinator.