DATE SUBMITTED
DATE DICC APPROVED 4/27/10
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CATALOG NO. AGBS 115

COURSE INFORMATION FORM

DISCIPLINE Agribusiness

COURSE TITLE Soil Fertility and Fertilizers

CR.HR 3  LECT HR. 3  LAB HR.  CLIN/INTERN HR.  CLOCK HR.

CATALOG DESCRIPTION

Types of fertilizer for soils and crops. Fertilizers: Their components, formulations and application.
Investigating aspects of the nature and properties of soils.

PREREQUISITES
None

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)

Upon completion of this course, the student will be able to:

1. Employ correct procedures for taking soil samples for soil testing purposes.
2. Distinguish different soil textures and soil types.
3. Analyze a soil test report and calculate amounts of fertilizer and lime to apply.
4. Explain cation exchange capacity and how it affects a soil's nutrient holding capacity.
5. Identify the primary and secondary plant nutrients and their role in plant growth and development.
6. Demonstrate proper calibration of fertilizer equipment and fertilizer application.
**GENERAL EDUCATION OUTCOMES (ESO)**

Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

1. Student will demonstrate skills necessary to identify and recommend ornamental plant materials appropriate for use in regional landscaping, including some native to Missouri.

2. Students will develop and demonstrate the ability to communicate clearly and effectively with others.

3. Students will apply essential math skills and use formulas appropriate in landscape projects.

4. Students will increase familiarity with appropriate resources to advance knowledge and network within their field of employment or as entrepreneurs.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Identification quizzes (2, 5)

2. Field demonstrations (1, 6)

3. Exams (3-5)
COURSE OUTLINE FORM

DISCIPLINE: Agribusiness

COURSE TITLE: Soil Fertility and Fertilizers

Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. The Importance and Origins and Development of Soil
   A. Soil: a three phase system supporting life and a medium for plant growth
   B. Land use including agricultural uses of soil
   C. The soil profile, body, minerals and parent material
   D. How climate, organisms, topography, time and humans affect soils

II. Soil Classification and Physical Properties
   A. Soil classification
   B. Soil texture, density and permeability
   C. Soil structure, consistency and tilth
   D. Soil pans, temperature and color

III. Life in the Soil
   A. The soil food chain and carbon cycle
   B. Distribution and functions of microorganisms
   C. Managing soil organisms and soil animals

IV. Soil Water, Conservation, Drainage and Irrigation
   A. The hydrologic cycle and how plants use water and roots gather water
   B. Types of soil water, resources and quality of water in the United States
   C. Water retention, measurement, reduction of water use and reclaiming soil water
   D. The importance of drainage, wetlands, wet soils, natural moisture regimes
   E. Artificial drainage, irrigation systems and their use

V. Soil Fertility and Organic Matter
   A. Plant nutrients, uptake and sources of elements in soil
   B. Soil minerals, colloids and cation exchange
   C. The nature and function of organic matter and effects on nitrogen
   D. Maintaining soil organic matter, soils and global climate

VI. Soil pH, Salinity Plant Nutrition and Soil Sampling and Testing
   A. Soil pH, it’s development and effects on plants
   B. Raising (liming soil), lowering (acidifying soil) soil ph and soil salinity
   C. Major nutrients, nitrogen, phosphorus, and potassium
   D. Minor nutrients including metallic, anionic trace elements
   E. Why and how to test soils and or plant tissues

VII. Fertilizers and Organic Amendments
   A. Selecting fertilizers, materials for, and forms and types of fertilizer
B. Fertilizer effects on soils and the environment
C. Animal manure, biosolids and compost

VIII. Tillage and Cropping Systems and Soil Conservation
   A. Uses of tillage, conventional versus conservation tillage
   B. Cropping systems, dryland farming and sustainable agriculture
   C. Consequences of water and wind erosion and climate change

IX. Horticultural Uses of Soil and Urban Soil
   A. Food crop vegetable and fruit culture
   B. Nursery field culture, container growing
   C. Landscaping, modified or structured soils
   D. Characteristics of urban soils, erosion and runoff

X. Government Agencies and Programs
   A. USDA Agencies
   B. USDA Conservation programs
   C. State and local efforts