BUTTE COLLEGE
COURSE OUTLINE

I. **CATALOG DESCRIPTION**

AGS 51 - Fertilizers and Plant Nutrition **3 Unit(s)**

Prerequisite(s): NONE
Recommended Prep: AGS 50
Transfer Status: CSU
51 hours Lecture

This course is a study of the composition, value, selection, and use of fertilizer materials and soil amendments within the context of soil, plant, and fertilizer relationships. Application practices currently being used in California will be discussed.

II. **OBJECTIVES**

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

A. Name the effect of major nutrients on plant growth, development, and disease resistance.
B. Identify the basic fertilizer requirements of major crops grown in the area.
C. Explain the importance of fertilizers in agricultural production.
D. List the different methods of applying fertilizers including the advantages and disadvantages of each method.
E. Explain the effect on pH that fertilizers have regarding crops, soil and fertilizer interactions.

III. **COURSE CONTENT**

A. **Unit Titles/Suggested Time Schedule**

Lecture

Topics	Hours
1. Essential plant growth elements and soil relationships	8.00
2. The fertilizer industry	3.00
3. Nitrogen, Phosphorus, Potasium (N-P-K)	10.00
4. Secondary elements	6.00
5. Trace elements	3.00
6. Methods of application	5.00
7. Fertilizer-pesticide combinations	2.00
8. Economics of fertilizer usage	4.00
9. pH effect on nutrients and pH control	5.00
10. Farm wastes	3.00
11. Nutrient budgets and regulatory compliance	2.00
Total Hours	51.00

IV. **METHODS OF INSTRUCTION**

A. Lecture
B. Guest Speakers
C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
D. Problem-Solving Sessions
E. Reading Assignments

V. **METHODS OF EVALUATION**

A. Quizzes
B. Oral Presentation
C. Homework
D. Mid-term and final examinations
E. Essays and research papers

VI. **EXAMPLES OF ASSIGNMENTS**

A. Reading Assignments
   1. Read the chapter on your text on information on soil pH and implications for macro and micro nutrient interactions. Be prepared to compare and contrast low and high pH soils.
   2. Read through the information provided by the instructor on essential plant nutrients. Be prepared to identify deficiency symptoms, causes, and treatments.

B. Writing Assignments
   1. Select an essential plant nutrient and indicate 1) mode of action in the plant, 2) fertilizer sources, 3) methods of application. Summarize in 3-4 page plan and accompanying PowerPoint.
   2. Select from the following low productivity soils: Saline, Sodic, Alkaline, Acidic. And develop a 3-4 page plan that identifies methods of remediation.

C. Out-of-Class Assignments
   1. Visit a wholesale fertilizer distributor. Prepare a two page written analysis of the products and services they provide.
   2. Locate at least three plants that exhibit signs of nutrient deficiency symptoms and take digital photographs of each. Be prepared to present your photographs to the class in a PowerPoint presentation.

VII. **RECOMMENDED MATERIALS OF INSTRUCTION**

Textbooks:

A. IPNI. Soil Fertility Manual. 19th Edition. International Plant Nutrition Institute, 2006.
B. Havlin, J., Tisdale S.,Beaton J., Nelson W. Soil Fertility and Fertilizers. 8th Edition. Pearson/Prentice Hall, 2014.

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