South Central College

# PLSC 2100 Agronomy Lab

## Common Course Outline

### Course Information

**Description** This course will include units of instruction on grain quality and grain grading, plant genetics and biotechnology, crop management, crop diseases and pests. Laboratory exercises will include grading grain, germination tests, test grain for protein, oil and moisture as well as problems and exercises related to genetics and biotechnology. Students will be expected to properly used various types of laboratory equipment.

**Total Credits** 2

**Total Hours** 48

### Types of Instruction

| Instruction Type | Credits/Hours |
|---|---|
| Classroom Presentation | |
| On-Campus Lab | |

### Pre/Corequisites

PLSC1300 Agronomy I

PLSC1400 Agronomy II

### Course Outcomes

**1. Understand the need and purpose of grading grain.**

**Learning Objectives**

Review the history of grain marketing

Show awareness for the need for grain standards for the producer and processor.

**2. Determine the grade on samples of corn, soybeans and oats.**

**Learning Objectives**

Identify the factors used in the grading of grain.

Use resources (grain grading standards) to identify the maximums and minimums of the various factors use in grading grain.

**3. Determine grain test weight, moisture content and oil content**

**Learning Objectives**

Properly gather and prepare a grain sample.

Operate the grain splitter, grain moisture tester, gram scales, grain sieves, analytical balance

**4. Calculate the price of corn and soybeans using the industry standards**

**Learning Objectives**
Obtain a pricing rubric for corn and soybeans
Calculate the price of a sample of graded corn using the pricing rubric

**5. Perform germination tests on corn, soybean, oats, alfalfa and clover seeds.**

**Learning Objectives**
Utilize references to understand the procedures in determining germination
Follow the demonstration/procedures given by the instructor
Explain when and why each of the germination procedures would be used

**6. Determine seed purity of seed samples (seed analysis**

**Learning Objectives**
Utilize the seed sample provided to determine the contaminates of the sample
Utilize references to help identify weed seeds, other crop seed and forages seeds

**7. Calculate pure live seed percentage**

**8. Identify the components of a monocot and dicot seeds, stems and leaves**

**Learning Objectives**
Explain the differences between monocotyledon and dicotyledonous
Observe the various components of the monocotyledon and cotyledons under the microscope.
Describe the functions of the components of the seeds, stems and leaves

**9. Explain the sequence of events involved in sexual reproduction from gametogenesis to fertilization**

**Learning Objectives**
Defend gene, chromosome, locus, allele, mitosis, and meiosis
Diagram the process of double fertilization which occurs in corn

**10. Acquire an understanding of how genetics plays a role in the production of hybrids and varieties**

**Learning Objectives**
Utilize Punnet square to solve simple breeding problems using Mendelian traits
Construct a model of DNA
Utilize corn to study genetic crosses
Recognize contrasting phenotypes
Collect data from F2 ears of corn, analyze the results from monohybrid and dihybrid crosses.
Study dominance, segregation and independent assortment of alleles in corn
Compare predicted results with results obtained from actual data

**11. Understand the use of genetic engineering in agriculture**

**Learning Objectives**
Describe the process of genetic engineering
Identify methods used in recombine DNA

**12. Display participation and professionalism in class**

**Learning Objectives**
Listen attentively to the instructor and other student speakers
Student in on task and participates in small group and class discussions
Student looks, acts and speaks professionally while interacting with instructor and other students.
Student is prepared for class by reading the assignments and completing the homework

**13. Understand the history of the study of genetics**

**Learning Objectives**
Construct a timeline of important dates in the study of genetics

Identify the discoveries responsible for the current understanding of genetics

14. **Use Punnet square to solve simple breeding problems using Mendelian traits**
15. **Construct a model of DNA**
16. **Identify methods used in recombine DNA**
17. **Describe the process of genetic engineering**
18. **Discuss the advantages and concerns of using genetic engineering in agriculture**
19. **Accept responsibility for preparing and attending class**
20. **Participate in class discussions**
21. **Display professional demeanor**

### SCC Accessibility Statement

Disability Services provides accommodations and other supports to students with permanent and temporary disabilities that affect their SCC experience. Disabilities may include mental health (anxiety, depression, PTSD), ADHD, learning disabilities, chronic health conditions (migraine, fibromyalgia), sensory disabilities, and temporary disabilities (broken arm, surgery). Common accommodations are extended test time, private room for testing, audiobooks, and sign language interpreter.

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