Western Technical College

10006101 Science in Agriculture

Course Outcome Summary

Course Information

Description	This course will provide students a comprehensive view of biotechnology concepts in modern day agriculture. Students will explore concepts in cell biology, genetic engineering and soil chemistry as it relates to animal and crop production.
Career Cluster	Agriculture, Food and Natural Resources
Instructional Level	A.A.S. - Associate in Applied Science
Total Credits	2
Total Hours	72

Textbooks

006-101 Science in Agriculture. Western. Publisher: Western. Required.

Program Outcomes

1. Investigate opportunities in Agribusiness.
2. Apply relevant technologies.
3. Create a Crop Management Plan.
4. Create a Livestock Management plan.

Course Competencies

1. Interpret structure of elements.

Assessment Strategies

1.1. Skill Demonstration
1.2. Drawing/Illustration
1.3. Written Product

Criteria

You will know you are successful when:

1.1. you build an atom of a given element.
1.2. you use the periodic table to identify common elements in agriculture and determine their properties.
1.3. you predict the formation of ions using the periodic table.
1.4. you determine the difference between isotopes and ions of common agricultural elements.
1.5. you identify the characteristics of metals, non-metals and transition elements using the Periodic table.

Learning Objectives

1.a. Investigate the structure of an element.
1.b. Explore the attraction between cations from anions.
1.c. Identify common agricultural elements on the Periodic table.

2. Examine the influence of elements in soil, plant and animals.

Assessment Strategies

2.1. Written Product

3. Differentiate between the types of bonds in compounds.

Assessment Strategies

3.1. Simulation
3.2. Written Product

Criteria

You will know you are successful when:

3.1. you explain the difference between ionic, covalent, polar covalent and metallic bonds.
3.2. you identify examples of different bonds in common compounds.
3.3. you name common agricultural compounds based on the type of bonds formed using correct nomenclature.

Learning Objectives

3.a. Identify the different types of bonds between elements.
3.b. Identify the names of common compounds used in agriculture

4. Determine the role acids and bases play in agriculture.

Assessment Strategies

4.1. Demonstration
4.2. Written Product

Criteria

You will know you are successful when:

4.1. you explain the Bronsted-Lowry definition of a acid and a base.
4.2. you perform a neutralization reaction on both acids and bases.
4.3. you describe the pH scale and determine the pH of acids and bases.
4.4. you explain the importance of acids and bases in animal physiology.
4.5. you identify the importance of acids and bases in soil structure.

Learning Objectives

4.a. Determine the pH of common agricultural products.
4.b. Explore the pH scale and the factors influencing the pH level.

5. Identify the role of enzymes in agriculture.

Assessment Strategies

5.1. Demonstration
5.2. Lab Report

Criteria

You will know you are successful when:

5.1. you describe the function and structure of enzymes.
5.2. you determine the effects of substrate, temperature and pH on enzyme function through hands-on laboratory.
5.3. you determine the effects of activators and inhibitors in enzymatic function.

Learning Objectives

5.a. Explore the effects of environment (pH & temperature) on the function of enzymes.
5.b. Explore the effect of pH on the function of enzymes.
5.c. Identify common roles of enzymes in agriculture.

6. Examine the anatomy and function of both plant and animal cells.

Assessment Strategies

6.1. Drawing/Illustration
6.2. Written Product

Criteria

You will know you are successful when:

6.1. you identify the parts of a plant and animal cell.
6.2. you describe the function of the organelles and the phosopholipid cell membrane in the animal cell.
6.3. you explain the 'Fluid Mosaic Model' of the cell membrane.
6.4. you demonstrate osmosis utilizing a hands on laboratory.

7. Explore biotechnology in agriculture.

Learning Objectives

7.a. Define agricultural biotechnology
7.b. Explore the use of genetic engineering in animal science.
7.c. Identify several current technologies and examine their impact on the livestock industry.
7.d. Identify problems related to the use of genetic engineering in animal science.
7.e. Explore the use of embryo transfer in animal science.