



Western Technical College

10522120 EDU: Techniques for Science

Course Outcome Summary

Course Information

Description Students are introduced to the content and processes of teaching science. Students explore science processes, strategies, procedures, assessment options and factors affecting science learning. Students study and practice strategies for assisting with group and individual activities in science. This course provides a solid foundation in the concepts and models of hands-on, student-centered science and its assessment as described in WI DPI Science Standards and Next Generation Science Standards.

Career Cluster Education and Training

Instructional Level Associate Degree Courses

Total Credits 3

Total Hours 72

Textbooks

No textbook required.

Success Abilities

1. Live Responsibly: Embrace Sustainability

Program Outcomes

1. Demonstrate instructional support strategies for content areas
2. Demonstrate instructional support strategies for content areas
3. Implement developmentally appropriate practices to foster learning
4. Implement developmentally appropriate practices to foster learning

5. Adapt instruction to meet the diverse needs of all learners
6. Adapt instruction to meet the diverse needs of all learners
7. Incorporate the reflective process to promote professional growth
8. Incorporate the reflective process to promote professional growth

Course Competencies

1. Examine factors that influence science instruction

Assessment Strategies

- 1.1. Oral, Written, Graphic and/or Skill Assessment

Criteria

Your performance will be successful when you:

- 1.1. identify professional organizations that influence science instruction.
- 1.2. identify standards that influence science instruction.
- 1.3. reference current resource(s)
- 1.4. describe how technology is used in science instruction.
- 1.5. describe how writing in science enhances critical thinking.
- 1.6. explain how personal experiences influence beliefs about science learning.

Learning Objectives

- 1.a. Determine feelings regarding science.
- 1.b. Reflect upon previous experiences with science instruction.
- 1.c. Explore children's attitudes about science.
- 1.d. Read about myths related to science.
- 1.e. Review why children should learn science.
- 1.f. Explore a brief history of science education.
- 1.g. Examine science standards.
- 1.h. Read about the role of technology in science education.

2. Apply the science process skills

Assessment Strategies

- 2.1. Oral, Written, Graphic and/or Skill Assessment

Criteria

Your performance will be successful when you:

- 2.1. explain the science process skills
- 2.2. demonstrate activities/an activity used to teach science process skills
- 2.3. determine if an activity(ies) used is developmentally appropriate
- 2.4. include materials
- 2.5. Include concise directions
- 2.6. Include safety measures
- 2.7. write a target learning objective
- 2.8. link activity to a science standard

Learning Objectives

- 2.a. Examine processes of science. (observing, classifying, inferring, measuring, communicating, predicting, hypothesizing, experimenting).
- 2.b. Explore how to incorporate science processes into scientific investigations.
- 2.c. Examine components of good scientific observing (senses, measurements, changes, questions, communication).
- 2.d. Describe manipulated, responding and control variables.

3. Examine the inquiry process in science

Assessment Strategies

- 3.1. Oral, Written, Graphic and/or Skill Assessment

Criteria

Your performance will be successful when you:

- 3.1. explain the inquiry process
- 3.2. explain the Guided Discovery approach
- 3.3. explain the 5-E model
- 3.4. identify an existing science lesson plan
- 3.5. describe how the lesson plan meets the features of inquiry
- 3.6. describe how the lesson plan meets the steps of either the Guided Discovery or 5-E model of instruction
- 3.7. describe how the lesson plan could be modified to better correspond with either the Guided Discovery or 5-E model of instruction
- 3.8. cite the source of lesson plan
- 3.9. explain the difference between open and closed questions
- 3.10. provide three examples of closed questions
- 3.11. provide three examples of open questions
- 3.12. identify strategic questioning within the lesson

Learning Objectives

- 3.a. Define inquiry.
- 3.b. Describe the features that characterize inquiry according to the National Research Council.
- 3.c. Examine the Guided Discovery Model of instruction.
- 3.d. Explore the 5-E Model of instruction.
- 3.e. Read about different strategies related to guided discovery and the 5-E model.
- 3.f. Use the scientific method.

4. Summarize science assessment options

Assessment Strategies

- 4.1. Oral, Written, Graphic and/or Skill Assessment

Criteria

Your performance will be successful when you:

- 4.1. identify formative assessments used in science
- 4.2. identify summative assessments used in science
- 4.3. explain how assessment aligns with stated objective

Learning Objectives

- 4.a. Define assessment.
- 4.b. State the purpose of assessment.
- 4.c. Explore different types of assessment.
- 4.d. Define performance assessment.
- 4.e. List performance assessments appropriate for science.
- 4.f. Define portfolio assessment.

5. Plan procedural tasks to address safety concerns in a science classroom

Assessment Strategies

- 5.1. Oral, Written, Graphic and/or Skill Assessment

Criteria

Your performance will be successful when you:

- 5.1. identify preparations necessary for a science activity
- 5.2. identify potential problems that may arise during a science activity
- 5.3. identify materials for a science activity
- 5.4. identify your role regarding safety in the science classroom
- 5.5. identify four safety guidelines according to the NSTA's current position statement on safety and school science instruction that could apply to the given science activity

Learning Objectives

- 5.a. Explore factors and strategies necessary in preparing for science learning.
- 5.b. Consider strategies to manage student behavior during science activities.
- 5.c. Consider appropriate materials for science activities.

5.d. Examine safety in the science classroom.

6. Examine the philosophy of STEM

Assessment Strategies

6.1. Oral, Written, Graphic and/or Skill Assessment

Criteria

Your performance will be successful when you:

6.1. identify the guiding principles of STEM

6.2. explain questioning methods

6.3. identify content and pedagogy to support high quality STEM experiences

7. Develop knowledge in a variety of topics in the areas of life science, physical science, earth and space science, and environmental science/outdoor education

Assessment Strategies

7.1. Oral, Written, Graphic and/or Skill Assessment

Criteria

You will know you are successful when

7.1. you write a targeted learning objective for life science lesson

7.2. you write a targeted learning objective for physical science lesson

7.3. you write a targeted learning objective for earth and space lesson

7.4. you write a targeted learning objective for environmental lesson

7.5. you link life science activity to a science standard

7.6. you link physical science activity to a science standard

7.7. you link earth and space activity to a science standard

7.8. you link environmental activity to a science standard

7.9. you include concise directions and materials needed for life science activity

7.10. you include concise directions and materials needed for physical science activity

7.11. you include concise directions and materials needed for earth and space science activity

7.12. you include concise directions and materials needed for environmental science activity

Learning Objectives

7.a. Examine standards for life science lessons

7.b. Examine standards for physical science lessons

7.c. Examine standards for earth and space lessons

7.d. Examine standards for environmental lessons