

**Fond du Lac Tribal and Community College
COURSE OUTLINE FORM**

03/19/19

Please return this form to the college vice president of academic affairs and the chairperson of the Academic Affairs and Standards Council (AASC)

1. Prepared by: _____

2. Date submitted: _____

3. Date approved: 12/1/2020 Date revised 2/2/2021, 12/8/21

4. Department/discipline: Education

5. Department(s) endorsement(s): _____
(Signatures of the person(s) providing the endorsement are required.)

6. Course Title: Science Methods
Abbreviated course title for Transcripts (25 characters or less): _____

7. Course Designator: EDU 8. Course Level: 3121

9. Number of Credits: Lecture 3 Lab _____

10. Control Number (on site) 30 Control Number (online) 25

11. Catalog/Course description:

This course will implement best practices in science literacy for elementary education classrooms. Students will study and apply current methods for science and environmental education. Theoretical background and practical skills necessary for teaching both process and content curriculum are developed through individual and group work. Six (6) hours of field experience are required.

12. Course prerequisite(s) or co-requisite(s): Accuplacer scores/ Other courses

Prerequisite(s): SCI 1280 Investigative Science I & SCI 1285 Investigative Science II

Co-requisite:

13. **Course Materials** (Recommended course materials and resources. List all that apply, e.g. textbooks, workbooks, study guides, lab manuals, videos, guest lecturers).

Title: *Teaching Children Science: A Discovery Approach, with Enhanced Pearson eText -- Access Card Package*, Derosa and Abruscato, 9th Edition, 2019, Pearson, 10-0134691792 or 13-9780134691794 (or recommended by the Dean of Education)

14. **Course Content** (Provide an outline of major topics covered in course)

- a. Reading and interpreting the Minnesota science standards for K-6
- b. Writing lessons and labs surrounding the K-6 Minnesota science standards
- c. Learning to evaluate and reinforce students' work surrounding K-6 science standards
- d. Best practices for writing lesson plans
- e. Inquiry method of teaching science and writing lesson plans
- f. Using inquiry method to tackle misconceptions
- g. Teaching the scientific method

- h. Evaluating the scientific method
- i. Researching and learning to use website and supplemental material
- j. Understanding the scientific tools needed to teach young children
- k. Laboratory safety, proper personal protective equipment (PPE), finding ways to use non-hazardous chemicals in activities
- l. Incorporating Native American Scientists who have contributed to the field
- m. Incorporating the Native American culture and how the people help to maintain balance

15. Learning Goals, Outcomes, and Assessment

At FDLTCC we have 4 Competencies Across the Curriculum (CAC) areas. They are as follows:

- A. Information Literacy (the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information.)
- B. Ability to Communicate (the ability to listen, read, comprehend, and/or deliver information in a variety of formats.)
- C. Problem Solving (the ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.)
- D. Culture (knowledge of Anishinaabe traditions and culture, knowledge of one’s own traditions and culture, knowledge of others’ traditions and cultures, culture of work, culture of academic disciplines and/or respect for global diversity.)

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

Learning Outcomes	Competencies (CAC)	Cultural Standards
Access, interpret and disseminate into their curriculum, the Minnesota state science standards and the Next Generation Science Standards (NGSS) for grades K-6 through classroom curriculum.	A, B, D	4
Demonstrate the ability to write effective lesson plans using Minnesota science standards for grades K-6 that will include, but not limited to various inquiry-methods (learning methods) which encompass indigenous peoples and peoples of color and other ethnic backgrounds.	A, B, C	2
Demonstrate the ability to evaluate and reinforce students’ work to give a better understanding of the scientific world and worldview around them by classroom work, projects and assessments.	A, B, C, D	

Demonstrate understanding of and evaluate work concerning the scientific method approach to science learning and understanding by working in small groups, classroom assignments and assessments.	A, B, C	
Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.	A, B, C	4
Demonstrate the understanding of natural cycles which protect the Earth and how Indigenous peoples have interacted and continue to interact with nature to protect their homes of the past, present and future.	C, D	6

WINHEC Cultural Standards:

1. **GIKENDAASOWIN – *Knowing knowledge*:** To develop human beings who value knowledge, learning, and critical thinking and are able to effectively use the language, knowledge, and skills central to an Ojibwe-Anishinaabe way of knowing.
2. **GWAYAKWAADIZIWIN – *Living a balanced way*:** To develop balanced human beings who are reflective, informed learners who understand the interrelatedness of human society and the natural environment, recognize the importance of living in harmony with creation, and are able to apply a systems approach to understanding and deciding on a course of action.
3. **ZOONGIDE'EWIN – *Strong hearted*:** To increase the students' capacity to live and walk with a strong heart, humble and open to new ideas and courageous enough to confront the accepted truths of history and society.
4. **AANGWAAMIZIWIN – *Diligence and caution*:** To develop students' capacity to proceed carefully, after identifying, discussing, and reflecting on the logical and ethical dimensions of political, social, and personal life.
5. **DEBWEWIN – *Honesty and integrity*:** To increase students' capacity to think and act with honesty and integrity as they understand and face the realities of increasingly interdependent nations and people.
6. **ZAAGI' IDIWIN – *Loving and Caring*:** To encourage students' acceptance of the diversity within their school, community, and environment by developing healthy, caring relationships built on respect for all.

7. **ZHAWENINDIWIN – Compassion:** To expand students' knowledge of the human condition and human cultures and the importance of compassion especially in relation to behavior, ideas, and values expressed in the works of human imagination and thought.

16. **Minnesota Transfer Curriculum (MnTC):** List which goal area(s) – up to two – this course fulfills.

See www.mntransfer.org

Goal Area(s): _____

Provide the specific learning outcomes as listed on the mntransfer.org website that pertain to this course.

17. Are there any additional licensing/certification requirements involved?

Yes No

Minnesota Professional Educator Licensing and Standards Board (MN PELSB)

MN PELSB: Standards 8710.2000 Standards of Effective Practice (SEP)

Subpart 4. **Standard 3, Diverse Learners:** A teacher must understand how students differ in their approaches to learning and create instructional opportunities that are adapted to students with diverse backgrounds and exceptionalities.

4R. identify and apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.

Subpart 9. **Standard 8, assessment.** A teacher must understand and be able to use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student. The teacher must:

7J. know how to ask questions and stimulate discussion in different ways for particular purposes, including probing for learner understanding, helping students articulate their ideas and thinking processes, promoting productive risk-taking and problem-solving, facilitating factual recall, encouraging convergent and divergent thinking, stimulating curiosity, and helping students to question;

9N. use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning.

MN PELSB Licensing Rule 8710.3200

Subp. 3. Subject matter standards, elementary education

A. A teacher of children in kindergarten through grade 6 must:

- (1) understand and apply the research base for and the best practices of kindergarten, elementary,
- (5) understand how to integrate curriculum across subject areas in developmentally appropriate ways;

J. A teacher of children in kindergarten through grade 6 must demonstrate a fundamental knowledge of scientific perspectives, scientific connections, science in personal and social perspectives, the domains of science, and the methods and materials for teaching science and scientific inquiry. The teacher must:

- (1) understand science as a human endeavor, the nature of scientific knowledge, and the historical perspective of science;

- (2) know and apply the understandings and abilities of scientific inquiry including the ability to:
- (a) identify questions and concepts that can be explored through scientific inquiry;
 - (b) design and conduct scientific investigations;
 - (c) use appropriate scientific instrumentation and equipment and mathematics as tools to improve scientific investigations and communications;
 - (d) compare the use of multiple types of inquiry for answering questions;
 - (e) evaluate alternative explanations and models based on evidence, current scientific understanding, and logic; and
 - (f) communicate and defend a scientific argument;
- (3) know how to make connections across the domains of science, between science and technology, and between science and other school subjects;
- (4) use scientific understandings and abilities when making decisions about personal and societal issues;
- (5) know and apply the fundamental concepts and principles of physical science concerning properties of and changes in matter; position, motion, and force; light, heat, electricity, and magnetism; and kinds of and ways to transfer energy;
- (6) know and apply the fundamental concepts and principles of life science concerning the characteristics of organisms, the life cycle of organisms, the interrelationships of organisms and environments, structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems and their interrelationships, and diversity and adaptations of organisms;
- (7) know and apply the fundamental concepts and principles of earth and space science concerning properties of earth materials; objects in the sky; changes in earth and sky; structure of the earth system, including hydrosphere, biosphere, atmosphere, and lithosphere; history of the earth; and earth in the solar system; and
- (8) know and apply pedagogy and classroom management in science and scientific inquiry including understanding:
- (a) content standards under chapter 3501 for recommendations regarding curriculum, instruction, assessment, professional development, and program development;
 - (b) how to teach scientific inquiry in a developmentally appropriate manner;
 - (c) common student misconceptions in science and developmentally appropriate strategies to elicit students' misconceptions and help them move to accepted scientific understandings; and
 - (d) how to implement safe environments for learning science through knowing:
 - i. state and national legal responsibilities and safety guidelines for teaching science;
 - ii. how to establish and enforce recognized safety procedures during the science learning experience;
 - iii. how to use required safety equipment for classroom, field, and laboratory settings including goggles, fire extinguisher, fire blanket, eye wash, and chemical shower;
 - iv. how to manage, maintain, and utilize science supplies and equipment;
 - v. state and national guidelines and plan for the care, storage, use, and disposal of chemicals and equipment used to teach science;
 - vi. the ethics of and restrictions on making and maintaining collections of scientific specimens and data; and
 - vii. the ethics of and restrictions on the use of live organisms, and how to acquire, care, handle, and dispose of organisms.

03/19/19