

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: 04/27/2021 Date revised 12/8/2021, 3/9/23

4. Department/discipline: Education

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

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

7. Course Designator: EDU 8. Course Level: 3122

9. Number of Credits: Lecture 3 Lab _____

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

11. Catalog/Course description:

This course is designed to prepare teacher candidates to evaluate, plan, and deliver math lessons appropriate for K-6 students. Candidates will also assess students understanding and skills through a student-centered, inquiry-based approach using the Minnesota Academic standards for K-6 Math. Topics to be covered are standardized skills/concepts in Number & Operation, Algebra, Geometry/Measurement, Data Analysis & Probability. Thirteen (13) hours of field experience is required for this course.

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

Prerequisite(s): Acceptance into the Elementary Education program
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).

Elementary and middle school mathematics: Teaching Developmentally Van de Walle Number Talks K-5 Sherry Parrish

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

1. The Minnesota Academic Standards for K-6 Math. State Process Standards
2. The National Council for Teachers of Mathematics (NCTM) Effective Math Teaching
3. Current influences on and reform movements in mathematics
4. Plan lesson development for the elementary classroom
5. Developmentally appropriate teaching that reflects a constructivist view of learning
6. Problem-solving as a principle instructional strategy
7. Formative and summative assessments in mathematics

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
Apply concepts of mathematical patterns, relations, and functions, including the importance of number sense and the importance of the educational link between primary school activities with patterns and the later conceptual development of important ideas related to functions.	C, D	1
Apply concepts and techniques of discrete mathematics and how to use them to solve problems from areas including graph theory, combinatorics, and recursion.	A, C	1
Use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student.	A, B	5
Interpret and draw inferences from data investigations.	C	5
Provide interactions and connections of historical and cultural mathematical perspectives.	B, D	6
Apply technology resources to enable and empower learners with diverse backgrounds,	B, D	6

characteristics, and abilities.		
Use a variety of instructional strategies to encourage student development of critical thinking, problem solving, and performance skills.	B, C	
Acquire number sense of concepts of numerical literacy.	C	
Identify real world applications concepts of space and shape.	B, C	
Make connections among mathematical processes to real world application.	A, B, D	

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

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

Subpart 3. Standard 2, student learning. A teacher must understand how students learn and develop and must provide learning opportunities that support a student's intellectual, social, and personal development. The teacher must:

3F. link new ideas to familiar ideas; make connections to a student's experiences; provide opportunities for active engagement, manipulation, and testing of ideas and materials; and encourage students to assume responsibility for shaping their learning tasks;

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 5. **Standard 4, Instructional Strategies:** A teacher must understand and use a variety of instructional strategies to encourage student development of critical thinking, problem solving, and performance skills.

5A. understand Minnesota's graduation standards and how to implement them;

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:

9A. be able to assess student performance toward achievement of the Minnesota graduation standards under chapter 3501;

9B. understand the characteristics, uses, advantages, and limitations of different types of assessments including criterion-referenced and norm-referenced instruments, traditional standardized and performance-based tests, observation systems, and assessments of student work;

9 K. monitor teaching strategies and behaviors in relation to student success to modify plans and instructional approaches to achieve student goals;

Licensing Rule 8710.3200 Subp. 3. Subject matter standards, elementary education

H. A teacher of children in kindergarten through grade 6 must demonstrate knowledge of fundamental concepts of mathematics and the connections between them. The teacher must know and apply;

(1) concepts of mathematical patterns, relations, and functions, including the importance of number and the importance of the educational link between primary school activities with patterns and the later conceptual development of important ideas related to functions and be able to:

(a) identify and justify observed patterns;

(b) generate patterns to demonstrate a variety of relationships; and

(c) relate patterns in one strand of mathematics to patterns across the discipline;

(2) concepts and techniques of discrete mathematics and how to use them to solve problems from areas including graph theory, combinatorics, and recursion and know how to:

(a) help students investigate situations that involve counting finite sets, calculating probabilities, tracing paths in network graphs, and analyzing iterative procedures; and

- (b) apply these ideas and methods in settings as diverse as the mathematics of finance, population dynamics, and optimal planning;
- (3) concepts of numerical literacy:
 - (a) possess number sense and be able to use numbers to quantify concepts in the students' world;
 - (b) understand a variety of computational procedures and how to use them in examining the reasonableness of the students' answers;
 - (c) understand the concepts of number theory including divisibility, factors, multiples, and prime numbers, and know how to provide a basis for exploring number relationships; and
 - (d) understand the relationships of integers and their properties that can be explored and generalized to other mathematical domains;
- (4) concepts of space and shape:
 - (a) understand the properties and relationships of geometric figures;
 - (b) understand geometry and measurement from both abstract and concrete perspectives and identify real world applications; and
 - (c) know how to use geometric learning tools such as geoboards, compass and straight edge, ruler and protractor, patty paper, reflection tools, spheres, and platonic solids;
- (5) data investigations:
 - (a) use a variety of conceptual and procedural tools for collecting, organizing, and reasoning about data;
 - (b) apply numerical and graphical techniques for representing and summarizing data;
 - (c) interpret and draw inferences from data and make decisions in a wide range of applied problem situations; and
 - (d) help students understand quantitative and qualitative approaches to answering questions and develop students' abilities to communicate mathematically;
- (6) concepts of randomness and uncertainty:
 - (a) probability as a way of describing chance in simple and compound events; and
 - (b) the role of randomness and sampling in experimental studies;
- (7) mathematical processes:
 - (a) know how to reason mathematically, solve problems, and communicate mathematics effectively at different levels of formality;
 - (b) understand the connections among mathematical concepts and procedures, as well as their application to the real world;
 - (c) understand the relationship between mathematics and other fields; and
 - (d) understand and apply problem solving, reasoning, communication, and connections; and
- (8) mathematical perspectives:
 - (a) understand the history of mathematics and the interaction between different cultures and mathematics; and
 - (b) know how to integrate technological and nontechnological tools with mathematics.

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