Anishinaabe and American Elementary Education Program

Fond du Lac Tribal and Community College

COURSE: Math 1050

Name: Kim Peddle

Course Title: **Mathematics for Elementary Teachers**

MTC Goal Area: _____

Credits: **4** **Pre-requisites:** MATH 1025 Introduction to Contemporary Mathematics

Co-requisites: _____

Course Description: This course provides content knowledge and instructional practices that prospective teachers will need to help K-6 students build numeracy and arithmetic knowledge via the most recent research in mathematics education. The overall objective of math education is to help each child understand mathematical concepts, establish a positive mathematical identity, build flexible reasoning, and build mathematical agency. Students will examine Carpenter's problem-type as a foundation for meeting Minnesota mathematics content standards as well as the National Council of Teachers of Mathematics standards. This course includes five (5) field experience hours.

Recommend Text and/or other Resources (journals, articles, and/or any other additional materials):

Elementary and Middle School Mathematics-Teaching Developmentally, 10th Edition, Van de Walle

Course Content:

- Teacher preparation for all learners in a technological society
- Mathematics as problem solving, communicating, and reasoning
- Mathematics for all that includes a broad range of content, a variety of contexts, and deliberate connections
- Learning mathematics as an active and constructive process
- Instruction based upon real world problems
- Assessment and evaluation as a means of improving instruction and learning
- The Anishinaabe perspective into mathematics

Outcomes and Assessments:

Learning Outcomes

- Develop and compare contextualized situations from Carpenter's Problem Type Chart with contexts that are relevant and engaging to all elementary education learners.
- Chart and track developmental stages of solving arithmetic operations.
- Organize raw data into frequency distributions and various graphs for analysis.
- Describe data using measures of central tendency, variation, and position.
- Analyze and apply information to solve problems using basic skills and operations with the real number system.
- Analyze at least protocols around mathematical errors and misconceptions for primary and intermediate learners.
- Analyze and apply implicit cultural tendencies of teachers, learners, and curriculum to increase student-led classroom discourse and interpret social and behavioral patterns, including Anishinaabeg.
- Examine the spatial patterns and geometric forms of traditional home life and social patterns of Anishinaabe people.

Cultural Standards*: listed at the end of the syllabus

*Each course within the BS in Elementary Education program must meet a minimum of 2 measurable learning outcomes for 3 different **Cultural Standards**. If your course does not meet the Cultural Standards, please justify your rationale.*

Standard (must meet 3)	**Learning Outcomes** (2 for each standard) The student will:	**Assessment**
1. GIKENDAASOWIN ***Knowing knowledge*** To prepare our students to be problem solvers who strive for continuous learning and growth. Outcome: Content/Pedagogical Knowledge and Technology Integration To develop teachers who value and utilize knowledge, learning, and critical thinking that is central to an Ojibwe-Anishinaabe way of knowing.	Develop and compare contextualized situations from Carpenter's Problem Type Chart with contexts that are relevant and engaging to all elementary education learners.	Integrate Anishinaabe storytelling practice into instruction by developing and comparing contextualized situations from Carpenter's Problem Type Chart with contexts that are relevant and engaging to all elementary education learners, The Problem Type Chart allows teachers to break down and rebuild story problems to make them more worthwhile and engaging for Anishinaabe and other diverse learner backgrounds and ways of knowing.
	Chart and track developmental stages of solving arithmetic operations.	Using implicit cultural traits from Hall's "cultural iceberg" students will chart and track developmental stages of solving for the 4 arithmetic operations and 14 problem types with Anishinaabe children and from videos of Anishinaabe students. Notating children's solution strategies allows teachers to be familiar with multiple ways of knowing and mathematical reasoning as children move through zones of proximal development. All students, but especially Native

		students tend to be very creative and they think outside the box and this may be difficult when asked to think in more traditional educational settings. Teacher candidates will explore examples of invented and alternative procedures for 14 problem types. Then they will chart and track developmental stages of solving for the 4 arithmetic operations and 14 problem types. This will include Anishinaabe ways of knowing.
5. DEBWEWIN ***Honesty and integrity*** Encourage students to develop a deeper appreciate their own worldview and the worldview of others. <u>Outcome:</u> Assessment and Use of Data To expand teachers' potential to think and act with honesty and integrity as they use multiple types of assessment strategies to evaluate student progress and guide student learning and development.	Organize raw data into frequency distributions and various graphs for analysis. Describe data using measures of central tendency, variation, and position.	Using data generated from social media platforms allows prospective teachers to quantify relevant data in bar graphs, pie graphs, pictographs, and line plots. This practice also helps teacher candidates to engage K-6 students in a culturally sustaining mindset and practices. Use familiar contexts from various real life examples (books, movies, apps, TV shows) to generate various graphs. Students will generate possible inferences from the data that can be made from these graphs, both correct and incorrect. Develop and execute interview protocol for Anishinaabe children that will assess mathematical solution strategies including modeling, counting, and deriving. Using data kept by tribal departments around natural resources and population analyze and calculate measures of central tendency, variation, and position. Teacher candidates will participate in a dice activity to examine basic probability via central tendencies. Teacher candidates will develop, use, and analyze basic surveys on social media to compile data sets and make various inferences.

ZHAWENINDIWIN – Compassion To encourage students to develop an empathetic appreciation of the arts and humanities as a way to understand the human experience. Outcome: Generation of New Knowledge To expand teachers' knowledge of the human condition and cultures, and the importance of compassion especially in relation to behavior, ideas, and values	Analyze and apply implicit cultural tendencies of teachers, learners, and curriculum to increase student-led classroom discourse and interpret social and behavioral patterns, including Anishinaabeg. Examine the spatial patterns and geometric forms of traditional home life and social patterns of Anishinaabe people.	Defining one's own implicit tendencies helps teacher candidates to examine social and emotional gaps between teachers and students that alienate Anishinaabe students and others whose culture does not align completely with mainstream culture. During field experience, observe and describe instructional practices that accommodate Anishinaabe learners, and those that support mainstream learning by contrast. Students will use an observation from that is specific to Anishinaabe students. Teacher candidates will use Geoboards to layout the floors of various traditional Native American home structures. Use a straight edge and compass to draw floor plans. Use patty paper as flooring for various structures. Teacher candidates will design floor plans that reflect their family's values and spaces, and how those tendencies influence learning today. They will then compare and contrast their family values with Native American home structures.

Minnesota Professional Education License and Standards Board Standards (MN PELSB)** listed at the end of the syllabus.

MN PELSB SEP Standard	***8710.2000 Standards of Effective Practice***	**Assignment & Assessment**	**How does this show students will meet the standard:** **Based on the assignments and assessments, the student will:**	**FDLTCC Learning Outcomes**	**Cultural Standard**
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;	Solve 6 cube problem by using base-10 manipulatives. Use base-10 blocks to explore perimeter and other challenging concepts.	Students will define concrete examples of abstract spatial concepts and use them to generalize algorithms via practice and example. For example, they will use toothpicks and sticky notes to build area models with missing dimensions. They will also use apps like Minecraft and build 3-dimensional puzzles to	Analyze and apply information to solve problems using basic skills and operations with the real number system.	N/A

			connect real life examples as a way to link new ideas with familiar ideas and to connect to students' experiences.		
11F	understand data practices	Participate in a dice activity to examine basic probability via central tendencies. Develop, use, and analyze basic surveys on social media to compile data sets and make various inferences. Classroom activity: run through sample lessons from the Mathalicious website that examine social issues. Classroom activity: Record and analyze common statements made by students that include frequency words like "every, all, never, always" and compare to statements that use data to support arguments. Classroom Activity: Listen to and notate student solutions to the same division problem. Classroom Activity: Discuss the complexities of math vocabulary and the importance of immersing kids in "math talk."	Education is a data driven profession. Prospective teachers will learn to develop, analyze, and draw accurate conclusions from various data sets as a way to understand data practices. Students will also learn to identify correlations in data that are statistically significant and look for specific patterns that imply empirical connections. Teacher candidates will participate in a dice activity to examine basic probability via central tendencies. Teacher candidates will develop, use, and analyze basic surveys on social media to compile data sets and make various inferences.	Describe data using measures of central tendency, variation, and position.	**DEBWEWIN** ***Honesty and integrity***

MN PELSB Content Standard	*8710.3200 Elementary Education: Subject Matter*	Assignment & Assessment	How does this show students will meet the standard: Based on the assignments and assessments, the student will:	FDLTCC Learning Outcomes	Cultural Standard
HA3a	*Concepts of numerical literacy:* (a) possess number sense and be able to use numbers to quantify concepts in the students' world;	Students will watch videos of children solving various problem types from Carpenter's framework. In the classroom, students will discuss math interventions based on formative math inquiries and assessments with peers. Paper assignment that describes math interventions based on formative math inquiries and assessments.	Carpenter's problem-type framework allows prospective teachers a deeper analysis of quantity and how it is situated, composed, and decomposed in real life situations that are relevant to learners based on their specific community characteristics. The videos will help students understand and differentiate developmental levels of mathematical reasoning. Distinguishing between levels of problem solving and student thinking helps to define numeracy concepts in terms of stages and development rather than leveled proficiency. Designing student interventions requires prospective teachers to analyze solution pathways and their proximity to numeracy standards. It also allows prospective teachers to creatively design student interventions based on proficiency (proximity to state standard).	Develop and compare contextualized situations from Carpenter's Problem Type Chart with contexts that are relevant and engaging to all elementary education learners.	**GIKENDAAS OWIN** ***Knowing knowledge***
HA3b	*Concepts of numerical literacy:* (b) understand a variety of computational procedures and how to use them in examining the reasonableness of the students' answers;	Students will complete the MN MCA 3rd Grade math assessment In class students will explore and discuss challenging assessment items and predict student errors.	Examining the state assessment allows students to compare their own math learning to what is expected of today's students and how to better provide learning experiences that are appropriate for all learners.	Develop and compare contextualized situations from Carpenter's Problem Type Chart with contexts that are relevant and engaging to all elementary	**GIKENDAAS OWIN** ***Knowing knowledge***

		Create solution pathways using various computational procedures for various assessment items.	Analyzing assessment items on the MN MCA with Carpenter's problem-type framework creates a deeper understanding of reasonability and why students often produce answers that reveal misconceptions in their mathematical understanding. Anticipating and understanding common errors on the MCA allows prospective teachers to define and address computational misconceptions and focus on reasonable thinking rather than memorizing facts and standard algorithms. Learning to embrace error as a part of learning creates honesty and integrity with one's self and math content. It diverts the focus of math on the "right answer" to individualized pathways of solving/thinking.	education learners.	
HA3c	*Concepts of numerical literacy:* (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;	Classroom Activity: Analyze Carpenter's problem type chart. Write contextualized situations using Carpenter's chart as a reference. Classroom Activity: Watch videos of students solving various problems.	The Problem-Type chart reduces the complexity of arithmetic and allows students to dive deeper into conceptual understanding rather than rote learning of math facts and procedures, simplifying the ambiguity of state standards at various grade levels. The analysis of measurement division, partitive division, and multiplication problem types allows prospective teachers to break down standard procedures into conceptual frameworks for	Develop and compare contextualized situations from Carpenter's Problem Type Chart with contexts that are relevant and engaging to all elementary education learners.	**GIKENDAASOWIN** ***Knowing knowledge***

			students to dig deeper in exploring number relationships.		
HA3d	*Concepts of numerical literacy:* (d) understand the relationships of integers and their properties that can be explored and generalized to other mathematical domains	Classroom Activity: Solve various problems at 3 levels including modeling, counting, deriving. Classroom Activity: Explore examples of invented and alternative procedures for 14 problem types.	Students will learn to recognize and demonstrate intradisciplinary connections with integers in composing and decomposing quantities derived from real life situations as well as prior learning concepts (whole numbers, place value, fractions). Notating children's solution strategies allows teachers to be familiar with multiple ways of knowing and mathematical reasoning as children move through zones of proximal development. All students, but especially Native students tend to be very creative and they think outside the box and this may be difficult when asked to think in more traditional educational settings. Students will explore examples of invented and alternative procedures for 14 problem types.	Chart and track developmental stages of solving arithmetic operations.	**GIKENDAASOWIN** ***Knowing knowledge*** .
HA4a	*Concepts of space and shape* (a) understand the properties and relationships of geometric figures	Homework Assignment: Develop tangram puzzles and solutions. Classroom Activity: Discuss MCA test specifications regarding geometric figures.	Students explore worthwhile task development with 2 dimensional shapes including simple proofs, area, and perimeter as outlined in MN state content standards. Allows students to see the range of spatial content required by the state of MN	Chart and track developmental stages of solving arithmetic operations.	**GIKENDAASOWIN** ***Knowing knowledge***
HA4b	*Concepts of space and shape* (b) understand geometry and measurement from both abstract and concrete perspectives and identify real world applications;	Classroom Activity: Solve cube problem by using base- 10 manipulatives. Classroom Activity: Use base-10 blocks to explore perimeter and other challenging concepts.	Students will define concrete examples of abstract spatial concepts and use them to generalize algorithms via practice and example. For example, they will use toothpicks and sticky notes to build area models with missing dimensions. They will also use apps like Minecraft and build 3-dimensional	Analyze and apply information to solve problems using basic skills and operations with the real number system.	**ZHAWENINDIWIN – Compassion**

			puzzles to connect real life examples.		
HA4c	*Concepts of space and shape* (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	Classroom Activity: Use Wigwametry curriculum to explore geometric concepts in building a scale model Ojibwe structure. Write 5 problems to extend learning concepts around circles and spheres using Wigwametry as the context.	Complete a hands-on project to connect abstract properties of circles like diameter and circumference to prior knowledge about circles and regular shapes Use Geoboards to layout the floors of various traditional Native American home structures. Use a straight edge and compass to draw floor plans. Use patty paper as flooring for various structures. Teacher candidates will design floor plans that reflect their family's values and spaces, and how those tendencies influence learning today. They will then compare and contrast their family values with Native American home structures. Use protractors to measure interior angles of a wigwam. Fill the structure with Unifix cubes to examine 3-dimensional space. Use platonic solids to compare cubic volume to spheric volume.	Examine the spatial patterns and geometric forms of traditional home life and social patterns of Anishinaabe people.	**ZHAWENI NDIWIN – Compassion**
HA5a	*Data investigations* (a) use a variety of conceptual and procedural tools for collecting, organizing, and reasoning about data;	Classroom Activity: Participate in a dice activity to examine basic probability via central tendencies. Homework Assignment: Develop, use, and analyze basic surveys on social media to compile data sets and make various inferences.	Students will generate data sets from real life experiments to examine true/false statements that match or don't match reasonable conclusions. Using data generated from social media platforms allows prospective teachers to quantify relevant data in bar graphs, pie graphs, pictographs, and line plots.	Organize raw data into frequency distributions and various graphs for analysis.	**DEBWEWIN *Honesty and integrity***

		Classroom Activity: Run through sample lessons from the Mathalicious website that examine social issues.	Use unifix cubes and drawings as concrete representations of data for information found in real life examples. Examine social injustices including racial profiling, poverty and housing, incarceration rates of various ethnicities for correlations.		
HA5b	*Data investigations* (b) apply numerical and graphical techniques for representing and summarizing data	Classroom Activity: Analyze basic games (carnival and game shows) for likelihood of winning. Classroom Activity: Use blocks and tools to represent possible/specific outcomes.	Students will use familiar pop culture contexts like Deal or No Deal and Price is Right to create outcome graphs and analyze data for patterns.	Analyze and apply information to solve problems using basic skills and operations with the real number system.	**ZHAWENINDIWIN – Compassion**
HA5c	*Data investigations* (c) interpret and draw inferences from data and make decisions in a wide range of applied problem situations	Classroom Activity: Design activities for primary children and anticipate misconceptions focused on reading and creating graphs. Barbie Bungee: Generating data from a real time experiment to plot data, calculate averages, and project a linear relationship between axes values	The creation of worthwhile tasks for children helps students anticipate possible misconceptions especially in real life contexts. Teacher candidates will use familiar contexts from various real life examples (books, movies, apps, TV shows) to generate various graphs. They will generate possible inferences from the data that can be made from these graphs, both correct and incorrect. Teacher candidates will complete an experiment using values to be graphed and summarized in a Cartesian plane. The relationship of these values is examined for correlation and then projected at higher values. These conjectures are then tested in a real life experiment with America's favorite doll.	Analyze and apply implicit cultural tendencies of teachers, learners, and curriculum to increase student-led classroom discourse and interpret social and behavioral patterns, including Anishinaabeg.	**ZHAWENINDIWIN – Compassion**
HA5d	*Data investigations* (d) help students understand quantitative and qualitative approaches to answering questions	Classroom Activity: Record and analyze common statements made by students that include frequency words like "every, all,	Prospective teachers will learn to distinguish quantitative and qualitative arguments by using common student language and learning to organize	Describe data using measures of central tendency, variation, and position.	**DEBWEWIN *Honesty and integrity***

	and develop students' abilities to communicate mathematically	never, always" and compare to statements that use data to support arguments. Classroom Activity: Listen to and notate student solutions to the same division problem. Field Observation: Discuss the complexities of math vocabulary and the importance of immersing kids in "math talk."	intentional discourse in the classroom. Transcribing children's thinking unveils the potential disconnects they experience while doing math. Math is a language. Immersion is the best way to acquire language. These activities will build discourse toolkits for prospective teachers.	Analyze and apply implicit cultural tendencies of teachers, learners, and curriculum to increase student-led classroom discourse and interpret social and behavioral patterns, including Anishinaabeg.	**ZHAWEN INDIWIN – Compassion**
HA6a	*Concepts of randomness and uncertainty* probability as a way of describing chance in simple and compound events	In the classroom, students will participate in a dice activity to examine basic probability via central tendencies.	Students will examine real life phenomena that appear to be random at first but hold precise confines when analyzed deeper. When defining outcomes for games that require a single di, the probability is simple. When dice are added, the probability becomes more complex as in Monopoly, or Yahtzee. For example, a player is more likely to land on Boardwalk if the player is 7 spaces away than 12 spaces away because there are more dice combinations that produce 7 when rolled.	Analyze and apply information to solve problems using basic skills and operations with the real number system.	**ZHAWENINDIWIN – Compassion**
HA6b	*Concepts of randomness and uncertainty* (b) the role of randomness and sampling in experimental studies	Classroom Activity: Complete the M & M project which requires sorting, cutting, pasting, coloring, and graphing.	At first, the candy colors in a bag of M & M's may seem random. Even after counting and sorting multiple bags, the color may still seem random. After graphing however, prospective teachers create visual evidence from the	Analyze and apply information to solve problems using basic skills and operations with the real	**ZHAWENINDIWIN – Compassion**

			collection of samples of the percentage of each color used by Mars Chocolate.	number system. Organize raw data into frequency distributions and various graphs for analysis.	**DEBWEWIN** ***Honesty and integrity***
HA7a	*Mathematical processes* (a) know how to reason mathematically, solve problems	Homework Assignment: Interview an elementary child with the problem-type protocol and record solutions. Homework Assignment: Identify proficiency levels of solutions from interview with child.	The interview of a child provides students with an opportunity to observe live thinking rather than simulated events. It further helps students use class content to classify thinking, analyze development, and predict reasoning.	Chart and track developmental stages of solving arithmetic operations.	**GIKENDAASOWIN** ***Knowing knowledge***
HA7b	*Mathematical processes* (b) understand the connections among mathematical concepts and procedures, as well as their application to the real world	Classroom Activity: Create Pictionary sentences to be illustrated in game format. Classroom Activity: Write contextualized situations starting from an algorithm.	Drawing the solutions to math problems clarifies the concreteness of basic arithmetic procedures. For example, a frog hopping away from a set of 5 frogs implies subtraction.	Analyze and apply information to solve problems using basic skills and operations with the real number system.	**ZHAWENINDIWIN – Compassion**
HA7c	*Mathematical processes* (c) understand the relationship between mathematics and other fields	Assignment:Students will write story problems using contexts from other content areas including seasonal and weather themes. Students will develop and align instructional methodologies to the Danielson Framework.	Using counterexamples and nonexamples, as in literacy, helps teachers to contrast math concepts, and vocabulary. Writing problems about classroom content, like science and art helps prospective teachers think about interdisciplinary connectivity. When prospective teachers compare a teaching methodology to the Danielson evaluation framework, they get a clear	Analyze and apply information to solve problems using basic skills and operations with the real number system.	**ZHAWENINDIWIN – Compassion**

			sense of the 4 domains of effective practice that many administrators use to provide feedback to classroom teachers.		
HA7d	*Mathematical processes* (d) understand and apply problem solving, reasoning, communication, and connections	Classroom activity: Students will ask questions during simulated error analysis. Classroom activity: Students will determine proximity of sample solutions to standards from "emerging" to "advanced" levels. Watch Mosner video of 5th graders exploring volume comparisons.	Analyzing misconceptions and practicing inquiry conditions prospective teachers to dig deeper into learner comprehension. Shifting from a "pass/fail" mentality to student-centered assessment that is scaled developmentally avoids the belief that some children are incapable of learning certain math concepts.	Analyze at least 3 protocols around mathematical errors and misconceptions for primary and intermediate learners.	N/A
HA8a	*Mathematical perspectives* (a) understand the history of mathematics and the interaction between different cultures and mathematics	Assignment: Students will create and analyze a poster of implicit cultural traits unique to Ojibwe people using Hall's cultural iceberg. Write about how historical trauma uniquely impacts the mathematical agency and identity of Ojibwe children. In the classroom, students will discuss how surface culture and implicit culture impact young learners.	Understanding mathematical identity starts with self-reflection for both prospective teachers and young learners. Students will examine their own implicit bias and how that impacts their ability to build and foster relationships in the classrooms despite diverse backgrounds.	Chart and track developmental stages of solving arithmetic operations.	**GIKENDAASOWIN *Knowing knowledge***

Course Requirements & Assessment descriptions:

1. Become confident in the ability to teach mathematics.
2. Learn the value of mathematics and problem solving.

3. Develop a perspective on the nature of mathematics and the role of mathematics in culture and society.
4. Understand the applications of mathematics.
5. Study mathematics content and mathematics pedagogy.
6. Understand that what students learn is fundamentally connected to how students learn it.
7. Identify problem types in mathematics
8. Understand the scope and sequence of elementary mathematics in knowledge, skills, and attitudes.
9. Be familiar with and able to use a variety of materials and manipulatives that are developmentally appropriate.
10. Understand and be able to use various methods and materials appropriate for teaching reluctant learners.
11. Understand how to teach mathematics as process rather than a finished product
12. Understand that problem solving is not an isolated concept but a process.
13. Create a ready-reference problem-solving interactive journal.
14. Examine elementary textbook series throughout the course to compare and contrast the presentation of concepts and skills.
15. Develop ways to reason mathematically, solve problems, and communicate mathematics effectively.
16. Learn how to create learning environments that support and encourage mathematical reasoning.
17. Understand the teacher's role in discourse.
18. Understand the impact of historical trauma on mathematical ability.
19. Develop lessons using a variety of instructional materials, resources, and strategies.
20. Understand assessment as an integral part of math instruction.
21. Become familiar with techniques for diagnosing and assessing students' needs.
22. Become familiar with and designs lessons around teaching technology.
23. Learn how to integrate other academic content into mathematics.

Requirements and Points:

**Full descriptions of Competencies and Cultural Standards contained in the Appendix*

To meet the program requirements, students must pass the course with 70% or above.

Grade	%	Points
A	100-90	750-675
B	89-80	674-600
C	79-70	599-525
D	69-60	524-450

Course Schedule: Please attach the course schedule/outline

Week	Class Activity-Topic	Assignment: Due
Week 1 Jan 10	Introductions Syllabus/Outline for classes Please have a journal/notebook available for class. You will be asked to journal frequently. Field Experience Observations/Hours Discussion Day 1 Establishing Classroom Norms-. Why is this important? Benefits of Discussion-Class Discuss Math Anxiety? Article linked How to teach- philosophy discussion	Please read chapter 1 *Elementary and Middle School Mathematics* Complete the Grade 3 MCA test. As you test, please use your journal to include: • insights • important vocabulary • things that are confusing to you (or might be confusing to a third grader) • concepts that need to be taught for a student to be successful on this test. Please upload a picture of your journal pages to D2L. We will use these as discussion points for the next class. 10 Points-Due Jan.16 Please read the article-What Every Teacher Needs to Know to Teach Native American Students. Please write a 1 page reaction essay including important information, your reaction, and any other comments/ideas/insights. 10 points. Due Jan. 23
Week 2 Jan 17	Rose and Thorn for last week Office Hours-and getting help Correct/Discuss MCA test Discuss Math Text Chapter 1 Math Talks-What are they? Math Talks Framework Math Journal (100pts): Prospective teachers keep a running record of critical notes in a student-friendly format that is updated weekly.	Math Journal (100pts): Prospective teachers keep a running record of critical notes in a student-friendly format that is updated weekly. Read Chapter 2-Math text
Week 3 Jan 24	Rose and Thorn Chapter 2 discussion- Blooms Taxonomy Constructivist Theory-Piaget Zone of Proximal Development-Vygotsky	Chapter 2 Quiz 10 points due Jan 23 In your journal-provide the answers to 6/8 fraction problems on page 42 of your math text.

	Math Talks-Making 10s, etc. Number Talks-Suggested Mental Math Strategies Table with Links Task 1-Patterns-Jump and Start Numbers (my lab in text) Observing and Responding to Student Thinking-Video 2.1 Task 2-Two Machines, One Job activity Task 3- One Up-One Down Addition Strategies, Multiplication Strategies Task 4-The Best Chance of Purple Creating diagrams for data and chance Look at and discuss possible strategies -Organizing data Tree diagram	Take a picture and upload to D2L 10 points Due January 30. Read Chapter 3 Text
Week 4 Jan 31 Bring Snap Cubes to Class	Rose and Thorn Discuss Homework 6/8 Fractions Chapter 3-Problem Solving Strategies and Organization Video 3.1 -Problem Solving Approach Handshakes Problem-organizing data Missing Numbers Activity How Thinking Works TED Talk 3.2 video Task Evaluation and Selection- Guide pg 67 (43 t.ed) How to develop complex age appropriate problems-rigor Analyze various student's solution to problems involving division of fractions (Leah, Kelly, Jaden, MacKenna)-How does analysis of student work allow teachers to assess student understanding?	Chapter 3 quiz 10 points due Feb 6 Read Chapter 4
Week 5 Feb 7 Materials for Hagrid Problem Ojibwe stories/children's lit for math	Rose and Thorn Harry Potter/Hagrid Problem (t.ed 42) Using Children's Literature to create math problems Brainstorm problems Classroom discussions (t.ed 49)	Using the task evaluation guide in your text on page 67, and the 8 mathematical practices that support student learning on page 60 in your text- Create a math task that could be used in an elementary classroom using Ojibwe stories or children's literature. Prepare lesson/present in class Provide any manipulatives, visuals, supporting materials 100 points-Due Feb 28
Week 6 Feb 14	Rose and Thorn Chapter 4 Discussion Lesson planning • Activate prior knowledge • Teach the lesson	Chapter 4 quiz- 10 points due Feb 20 3 ACT task essay 10 points due Feb 20

	• Promote discussion • Evaluate How to create a lesson plan 3 act tasks-elementary https://gfletchy.com/3-act-lessons/ Differentiating Flexible Grouping Best Practice Video 4.1-Negative effects of ability grouping Family engagement/Homework	

Week 7
Feb 21
	Rose and Thorn
	Chapter 5 Discussion
	Assessments
	• Formative
	  ○ Observations
	  ○ Anecdotal Notes
	  ○ Question Probs
	  ○ Interviews
	  ○ Problem based Tasks
	• Summative
	  ○ Rubrics
	  ○ Journaling
	  ○ Student Self/exit slips
	  ○ Tests
	High Stakes Tests-MCAs
		Chapter 5 Quiz 10 points due
		Feb 27

Week 8 Feb 28	Present Children's Literature Problems	Read Chapter 6
Week 9 March 6	Rose and Thorn Chapter 6 Discussion Teaching Equitably to ALL students Culturally Responsive Mathematics Students will analyze a poster of implicit cultural traits unique to Ojibwe people using Hall's cultural iceberg and learn about how historical trauma uniquely impacts the mathematical agency and identity of Ojibwe children. In the classroom, students will discuss how surface culture and implicit culture impact young learners. Tier 1, 2, 3 Interventions Academic Vocabulary Accommodation/Modification Honoring Diversity Video 6.1 Honoring Language 6.2 Culturally Relevant Instruction Finding Math in homes and communities TedxTalk on culturally relevant pedagogy in mathematics https://www.youtube.com/watch?v=EjLOuUhN6xY Integration!	Chapter 6 Quiz Due March 19 Read Chapter 7 Culturally Relevant Instruction Essay 50 points Due April 2
Week 10 March 20	Rose and Thorn Chapter 7 Building Number Concepts and Number Sense Subitizing Zero! Counting Moose Tracks Game Video 7.1 Attribute Blocks Dot Cards	Chapter 7 Quiz due March 27 Pick one of the games/lessons in this chapter. Learn the game and teach it to the class. Due April 13 50 points

	10 Frames https://youtu.be/UoQzv4wxmUE In this video, a teacher leads a number talk using a life-sized ten frame to help students explore combinations of ten. Focus on minutes 3:30-8:12 of the video for the best user experience. Estimation Measurement Data	
Week 11 March 27	No In person class Worktime for Game	Read Chapter 8
Week 12 April 3	Rose and Thorn Chapter 8 Developing Meanings for Operations Addition and Subtraction Multiplication and Division Arrays Factors/Factor Patterns Problem Types Identifying Misconceptions Discussion of Danielson Framework	Chapter 8 Quiz 10 points Due April 9 Read Chapters 9 and 10
Week 13 April 10	Rose and Thorn Chapter 9 Fact Fluency Chapter 10 Place Value-Base 10	Chapter 9 Quiz 10 points Chapter 10 Quiz 10 points Due April 16 Read Chapter 11
Week 14 April 17 **Base 10 Place Value Mats**	Rose and Thorn Chapter 11 Strategies for Computation Addition/Subtraction Base 10 Place Value Mats Connecting Addition/Subtraction to Place Value Partial Sums/Expanded Form Trading with Zero Hundreds Chart Standard Algorithms Invented Strategies Estimation-Under or Over Rounding Literature-The Great Math Tattle Battle National Geographic Kids	Quiz Chapter 11 Due April 23 Read Chapter 12
Week 15 April 24	Rose and Thorn Chapter 12 Stategies for Computation Multiplication/Division Repeated Addition Expanded Form Area Models Lattice Box Method/Open Array Division with cubes Missing factor Invented Division Video 12.7 Repeated subtraction Break apart	Chapter 12 Quiz Due April 30

Final Project	Create a lesson plan to teach (grade 3 or above) a non-standard method for addition, subtraction, multiplication or division.	100 points Due May 1

Grading

Observation Activities/Interview/Journal 60 points
Math Journal 100 points
Grade 3 MCA reflection 10 points
Teaching Native American Students Reflection/Essay 10 point
In class participation and attendance 150 points
Chapter quizzes 120 points
Create a math task that could be used in an elementary classroom using Ojibwe stories or children's literature. Prepare lesson/present in class. Provide any manipulatives, visuals, supporting materials. 100 points

Math Games Lesson 50 points

Culturally Relevant Instruction Essay 50 points

Create a lesson plan to teach (grade 3 or above) a non-standard method for addition, subtraction, multiplication or division. 100 points

Appendix A

FDLTCC Competencies Across the Curriculum (CAC)

Information Literacy – the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information.

Ability to Communicate – the ability to listen, read, comprehend, and/or deliver information in a variety of formats.

Problem Solving – The ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.

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.

Conceptual Framework

Vision

The vision of the FDLTCCC Education Unit is to be transformational leaders in culturally responsive pedagogy and Indigenous knowledge by embracing Niindaa'iwedaa o'o gikendaasowin, which means sending knowledge into the future by embedding Anishinaabe knowledge, culture, and traditions into the curriculum and instilling these teaching practices in our future educators.

Mission

The mission of the FDLTCC Education Unit is to work within our communities to prepare caring, competent educators by promoting equitable, inclusive, and transformative educational practices that are based on Anishinaabe knowledge, traditions, and culture.

GIKENDAASOWIN – Knowing Knowledge

To prepare our teacher candidates to be problem solvers who strive for continuous learning and growth.

Disposition: Integrates Content and Pedagogical Knowledge

Teacher candidates demonstrate their ability to integrate content and pedagogical knowledge by weaving the following into their teaching:

- *Technology:* Use technology effectively to improve student learning.
- *Theory to Practice*: Applies current theory, research, and best practices to improve one's professional practice as a teacher.
- *Critical and Connected Thinking*: Engages in critical thinking that reflects analysis, problem solving, and incorporates world views and community knowledge to create culturally relevant instruction.
- *Reflective Practice:* Demonstrates self-reflection and incorporates professional feedback to adjust for continuous improvement in professional practices and effective instruction.

Professional Outcome: Content and Pedagogical Knowledge

1. To develop teachers who value and utilize knowledge, learning, and critical thinking that is central to Indigenous and other ways of knowing.

GWAYAKWAADIZIWIN – Living a Balanced Way

To provide teacher candidates the opportunity to recognize the importance of living in harmony with the community and are prepared to use a collective approach to understanding and deciding on a course of action.

Disposition: Communication and Collaboration

Teacher candidates demonstrate professional interpersonal and communication skills. These skills are used to promote positive collaborative partnerships with students, families, colleagues, other school professionals, and the global community to support achievement of student learning outcomes.

- *Reflective Collaboration*: Uses insights and inspiration of others to improve practice and can occur in:
  - Professional Learning Communities
  - Mentoring Programs
  - Peer Observations
  - Critical Friends Groups
- *Community Involvement*: Demonstrates positive collaborative skills in interactions with instructors, advisors, students, colleagues, parents/guardians/caregivers, school teams, and those in the wider community.
- *Communication*: Effectively and accurately communicates ideas, thoughts or visions (oral and written) and engages in active listening based on audience and community cultural norms.

Professional Outcome: Community and Collaboration

1. To develop teachers who are reflective, connected educators who understand the interrelatedness of educating the whole child by including the community.

ZOONGIDE'EWIN – Strong Hearted

To provide a foundation on which we build and strengthen each teacher candidate's resilience, innovation, and passion.

Disposition: Vision and Leadership

Teacher candidates demonstrate the vision and skills necessary to lead and manage classrooms and schools as complex, adaptive systems in a changing world.

- Demonstrates skills and qualities that lead to meaningful change.
- Models and fosters respect for all cultures, identities, and perspectives in words and actions and considers historical pasts to prepare for the future.
- Listens and responds to community needs and understands cultural norms as opportunities for growth and development.

Professional Outcome: Transformational Leadership

1. To increase the teachers' leadership capacity to live and walk with a strong heart, respectful and open to new ideas and courageous enough to confront the accepted truths of history and society.

AANGWAAMIZIWIN – Diligence and Caution

To develop teacher candidates' capacity to proceed carefully, after identifying, discussing and reflecting on logical and ethical dimensions of political, cultural, social, and personal life.

Disposition: Ethical Behavior

Teacher candidates demonstrate professional integrity through behaviors and actions that reflect state and FDLTCC ethical and cultural standards.

- Demonstrate professional and ethical conduct with faculty, faculty supervisors, cooperating teachers, students, parents, colleagues, and community.
- Practices, complies, and understands the school site and the college and unit policies (e.g., academic honesty), as well as Minnesota Code of Ethics for Teachers.
- Adheres to all professional standards, including the use of technologies (e.g., accesses authorized websites, social media and other applications, and uses personal electronic devises as appropriate).

Professional Outcome: Ethical Practitioner

1. To develop teachers' capacity to be ethically responsive in respecting their role as an educator and understanding community needs.

DEBWEWIN – Honesty and Integrity

Encourage teacher candidates to develop a deeper appreciation of their own worldview and the worldview of others.

Disposition: Data-Informed Practice

Teacher candidates demonstrate ability to make data-driven decisions as they plan, implement, and evaluate instruction.

- Uses student data to plan and implement instructional strategies and activities.
- Uses assessment data to identify student strengths and deficiencies and adjusts practice based on results.
- Uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual and social development of the student.

Professional Outcome: Assessment and Use of Data

1. To expand teachers' potential to think and act with honesty and integrity as they use multiple types of assessment strategies to evaluate student progress and guide student learning and development.

ZAAGI' IDIWIN – Loving and Caring

To encourage the teacher candidates' development of healthy, caring relationships built on respect for all.

Disposition: Equity, Social Justice, and Inclusion

Teacher candidates demonstrate fairness, empathy and compassion based on their belief that everyone can learn. Candidates actively seek out multiple perspectives and diverse experiences to address the academic, interpersonal, and emotional needs of all students.

- Demonstrates and appreciation of the languages, communities, and experiences students bring to the classroom.
- Advocates for and supports Indigenous and other diverse communities and individuals.
- Respects the dignity and essential worth of all individuals.
- Interacts with sensitivity to community and cultural norms.
- Values and responds to all aspects of a child's developmental well-being (cognitive, emotional, psychological, social, and physical).
- Promotes the diversity of opinions, ideas, and backgrounds.

Professional Outcome: Diversity

1. Promote teachers' acceptance and respect of the diversity within their school, community and environment.

ZHAWENINDIWIN – Compassion

To encourage teacher candidates to develop an empathetic appreciation of the arts and humanities as a way to understand the human experience.

Disposition: Life-long Learner

Teacher candidates engage in professional growth and encourage curiosity and inquiry as reflective agents of change by sharing knowledge responsibly and participating as a community resource.

- Demonstrates commitment to professional development and intellectual curiosity.
- Practices current skills while demonstrating ability to adapt and develop new skills.
- Actively participates or fosters the positive professional learning environment within the school community as well as the school- home relationships.
- Analyzes various professional contexts, resulting in more informed decision-making about professional practice.

Professional Outcome: Generation of New Knowledge

To expand teachers' knowledge of the human condition and cultures, and the importance of compassion especially in relation to behavior, ideas, and values.

MN PELSB SEP and/or Content Standards

8710.2000 Standards of Effective Practice

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;

11F understand data practices

Content Standards 8710.3200 Elementary Education

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:

(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:

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(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;