



Fond du Lac Tribal and Community College
Elementary Education Program



Course Number: EDUC 3122

Course Title: Math Methods

Faculty Name: Kimberly Peddle M. ED

MTC Goal Area: _____

Credits: 3 Pre-requisites: EDUC MATH 1050 Co-requisites: _____

Successful admittance into the Elementary Education Teacher program required? Yes: No: _____

Field Experience/Student Teaching? Yes: _____ Number of hours/weeks: 13 hours No: _____

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.

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

ISBN 9780134802084 Edition: 2019

Course Content:

- The Minnesota Academic Standards for K-6 Math. State Process Standards
- The National Council for Teachers of Mathematics (NCTM) Effective Math Teaching
- 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



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FDLTCC Learning Outcomes:

1. Apply 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.
2. Apply concepts and techniques of discrete mathematics and how to use them to solve problems from areas including graph theory, combinatorics, and recursion.
3. Use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student.
4. Interpret and draw inferences from data investigations.
5. Provide interactions and connections of historical and cultural mathematical perspectives.
6. Apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.
7. Use a variety of instructional strategies to encourage student development of critical thinking, problem solving, and performance skills.
8. Acquire number sense of concepts of numerical literacy.
9. Identify real world applications concepts of space and shape.
10. Make connections among mathematical processes to real world application.

Cultural Standards:

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

Cultural Standard (must meet 3 of 7)	Learning Outcomes that Align to Cultural Standards (two for each standard) The student will:	Cultural Assessment Description
<p>1. GIKENDAASOWIN – Knowing Knowledge To prepare our teacher candidates to be problem solvers who strive for continuous learning and growth.</p> <p><u>Disposition:</u> <i>Integrates Content and Pedagogical Knowledge</i> Teacher candidates demonstrate their ability to integrate content and pedagogical knowledge by weaving the following into their teaching:</p> <ul style="list-style-type: none"> • <i>Technology:</i> Use technology effectively to improve student learning. • <i>Theory to Practice:</i> Applies current theory, research, and best practices to improve one’s professional practice as a teacher. 	<p>Apply 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.</p> <p>Apply concepts and techniques of discrete mathematics and how to use them to solve</p>	<p>Development of a culturally responsive lesson plan that integrates academic vocabulary and attends to students' mathematical identities.</p> <p>Teacher candidates will demonstrate their understanding of mathematical patterns by creating a visual project that identifies, generates, and explains various patterns in real-world contexts.</p> <p>TCs will complete a project that involves creating a network graph based on a real-world scenario, calculating probabilities, and presenting their findings.</p>



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<ul style="list-style-type: none"> • <i>Critical and Connected Thinking</i>: Engages in critical thinking that reflects analysis, problem solving, and incorporates world views and community knowledge to create culturally relevant instruction. • <i>Reflective Practice</i>: Demonstrates self-reflection and incorporates professional feedback to adjust for continuous improvement in professional practices and effective instruction. <p><u>Professional Outcome: Content and Pedagogical Knowledge</u> To develop teachers who value and utilize knowledge, learning, and critical thinking that is central to Indigenous and other ways of knowing.</p>	<p>problems from areas including graph theory, combinatorics, and recursion.</p>	<p>TCs will complete a project (Wigwametry) where they create a geometric model using various tools (geoboards, compass, ruler, etc.) and present their findings on the properties of the figures and their applications in real life.</p> <p>TCs will complete a probability analysis assignment that includes calculating probabilities for simple and compound events, interpreting results, and discussing the implications of randomness in data sampling</p> <p>TCs will complete a project that involves solving a real-world problem using mathematical reasoning and presenting their findings effectively, demonstrating their understanding of the connections among mathematical concepts and procedures</p> <p>TCs will complete a probability analysis assignment that includes calculating probabilities for simple and compound events, interpreting results, and discussing the implications of randomness in data sampling</p> <p>TCs will research a specific cultural contribution to mathematics made by the Anishinaabe and create a presentation to share their findings.</p>
<p>5. DEBWEWIN – Honesty and Integrity Encourage teacher candidates to develop a deeper appreciation of their own worldview and the worldview of others.</p> <p><u>Disposition: Data-Informed Practice</u> Teacher candidates demonstrate ability to make data-driven decisions as they plan, implement, and evaluate instruction.</p> <ul style="list-style-type: none"> • 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. 	<p>Use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student.</p> <p>Interpret and draw inferences from data investigations.</p>	<p>TCs will complete an assessment which evaluates their understanding of assessment strategies for K-6 mathematics education aligned with Minnesota Academic Standards</p> <p>TCs will create a comprehensive assessment plan that includes both formal and informal assessment strategies tailored to meet the needs of diverse learners. They will present this plan in a group setting and provide a rationale for their selected strategies.</p> <p>TCs will complete a probability analysis assignment that includes calculating probabilities for simple and compound</p>



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<p><u>Professional Outcome: Assessment and Use of Data</u></p> <ul style="list-style-type: none"> 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. 		<p>events, interpreting results, and discussing the implications of randomness in data sampling</p> <p>TCs will complete a project that involves solving a real-world problem using mathematical reasoning and presenting their findings effectively, demonstrating their understanding of the connections among mathematical concepts and procedures</p> <p>TCs will complete a probability analysis assignment that includes calculating probabilities for simple and compound events, interpreting results, and discussing the implications of randomness in data sampling</p> <p>Teacher Candidates will design a data investigation appropriate for a specific elementary grade level, demonstrating understanding of the statistical process, age-appropriate techniques, and effective communication strategies</p>
<p>6. ZAAGI' IDIWIN – Loving and Caring</p> <p>To encourage the teacher candidates' development of healthy, caring relationships built on respect for all.</p> <p><u>Disposition: Equity, Social Justice, and Inclusion</u></p> <p>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.</p> <ul style="list-style-type: none"> 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. <p><u>Professional Outcome: Diversity</u></p>	<p>Provide interactions and connections of historical and cultural mathematical perspectives.</p> <p>Apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.</p>	<p>Development of a culturally responsive lesson plan that integrates academic vocabulary and attends to students' mathematical identities.</p> <p>Development of a culturally responsive lesson plan that integrates academic vocabulary and attends to students' mathematical identities.</p> <p>TCs will complete a project (Wigwametry) where they create a geometric model using various tools (geoboards, compass, ruler, etc.) and present their findings on the properties of the figures and their applications in real life.</p>



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<ul style="list-style-type: none"> Promote teachers' acceptance and respect of the diversity within their school, community and environment. 		
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Minnesota Professional Education License and Standards Board Standards (MN PELSB)** listed at the end of the syllabus. (Insert more rows as needed.)

8710.2000 Standards of Effective Practice -Student Learning

MN PELSB SEP Standard Code	8710.2000 Standards of Effective Practice	Learning Opportunities *Include the Field Experience hours as applicable for clarity.	Based on the learning opportunities and assessments, the K-6 learner will demonstrate meeting this standard by: Assessment	FDLCC Learning Outcomes	Cultural Standard
1.D.	The teacher understands how alignment with a student's cultural background is necessary to make meaningful connections that enable the construction of knowledge and acquisition of skills.	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: KEY POINTS: <ul style="list-style-type: none"> Modifications vs. Accommodations: Understanding how to adjust assignments and assessments. Multitiered Systems of Support: Components that help struggling students, including interventions and supports. Culturally Responsive Instruction: Importance of student backgrounds in mathematics learning. Gifted and Talented Students: Strategies for challenging advanced learners. Developing Resilience: Techniques to foster a positive 	Development of a culturally responsive lesson plan that integrates academic vocabulary and attends to students' mathematical identities.	1, 5	1, 6



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		mindset towards math.			
<p>Learning Opportunities and Assessment for Standard 1.D.: FDLTCC Subject Matter: 1,5 Cultural Standard: 1 Teaching Mathematics Equitably to All Students TCs will be able to differentiate between modifications and accommodations, describe components of multitiered systems of support, explain culturally responsive instruction, apply knowledge for working with gifted students, and illustrate approaches to develop resilience in mathematics. ASSESSMENT: Development of a culturally responsive lesson plan that integrates academic vocabulary and identifies students' mathematical identities. KEY POINTS:</p> <ul style="list-style-type: none"> ● Modifications vs. Accommodations: Understanding how to adjust assignments and assessments. ● Multitiered Systems of Support: Components that help struggling students, including interventions and supports. ● Culturally Responsive Instruction: Importance of student backgrounds in mathematics learning. ● Gifted and Talented Students: Strategies for challenging advanced learners. ● Developing Resilience: Techniques to foster a positive mindset towards math. <p>Assessment rubric will be provided to teacher candidates.</p>					
3.A.	The teacher understands the varying types and multiple purposes of assessment.	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> ● Understanding the difference between formal and informal assessments. ● The importance of data-driven decision-making in instructional planning. ● Identifying student strengths and weaknesses through assessment. ● Adapting instruction based on assessment results. ● The role of continuous assessment in fostering student development. 	TCs will complete an assessment which evaluates their understanding of assessment strategies for K-6 mathematics education aligned with Minnesota Academic Standards	3	5
3.F.	The teacher regularly assesses individual and group	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:	TCs will complete an assessment which evaluates their understanding of assessment strategies for K-6 mathematics education aligned	3	5



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	<p>performance in order to design and modify instruction to meet students' needs in each area of development, including cognitive, linguistic, social, emotional, and physical, and scaffolds the next level of development</p>	<ul style="list-style-type: none"> • Understanding the difference between formal and informal assessments. • The importance of data-driven decision-making in instructional planning. • Identifying student strengths and weaknesses through assessment. • Adapting instruction based on assessment results. • The role of continuous assessment in fostering student development. 	<p>with Minnesota Academic Standards</p>		
<p>Learning Opportunities and Assessment for Standard 3.A., 3.F.: FDLTCC Subject Matter: 3 Cultural Standard:5 LEARNING OBJECTIVE: TCs will be able to utilize both formal and informal assessment strategies to evaluate and enhance the intellectual, social, and physical development of students. ASSESSMENTS: TCs will complete an assessment which evaluates their understanding of assessment strategies for K-6 mathematics education aligned with Minnesota Academic Standards KEY POINTS:</p> <ul style="list-style-type: none"> • Understanding the difference between formal and informal assessments. • The importance of data-driven decision-making in instructional planning. • Identifying student strengths and weaknesses through assessment. • Adapting instruction based on assessment results. • The role of continuous assessment in fostering student development. <p>Assessment rubric will be provided to teacher candidates.</p>					
<p>4.C.</p>	<p>The teacher creates or adapts lessons, unit plans, learning experiences, and aligned assessments based on Minnesota's academic standards, or if unavailable, local, national, or</p>	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: KEY POINTS:</p> <ul style="list-style-type: none"> • Understanding the difference between formal and informal assessments. • The importance of data-driven decision-making in instructional planning. 	<p>TCs will create a comprehensive assessment plan that includes both formal and informal assessment strategies tailored to meet the needs of diverse learners. They will present this plan in a group setting and provide a rationale for their selected strategies.</p>	<p>3</p>	<p>5</p>



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	international discipline-specific standards.	<ul style="list-style-type: none"> Identifying student strengths and weaknesses through assessment. Adapting instruction based on assessment results. The role of continuous assessment in fostering student development. 			
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Learning Opportunities and Assessment for Standard 4.C.:
 FDLCC Subject Matter: 3
 Cultural Standard: 5
LEARNING OBJECTIVE: TCs will be able to utilize both formal and informal assessment strategies to evaluate and enhance the intellectual, social, and physical development of students.
ASSESSMENTS: TCs will create a comprehensive assessment plan that includes both formal and informal assessment strategies tailored to meet the needs of diverse learners. They will present this plan in a group setting and provide a rationale for their selected strategies.
KEY POINTS:

- Understanding the difference between formal and informal assessments.
- The importance of data-driven decision-making in instructional planning.
- Identifying student strengths and weaknesses through assessment.
- Adapting instruction based on assessment results.
- The role of continuous assessment in fostering student development.

Assessment rubric will be provided to teacher candidates.

8710.3200 Elementary Education: Subject Matter:

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:

MN PELSB Content Standard code	8710.3200 Elementary Education: Subject Matter	Learning opportunities *Include the Field Experience hours as applicable for clarity.	Based on the learning opportunities and assessments, the K-6 learner will demonstrate meeting this standard by: Assessment	FDLCC Learning Outcomes	Cultural Standard
H.1.a.	identify and justify observed patterns	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:	Teacher candidates will demonstrate their understanding of mathematical patterns by creating a visual project that identifies,	7, 8, 10	1



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		<ul style="list-style-type: none"> • Mathematical patterns are sequences that follow a specific rule or relationship. • Functions describe relationships between variables and often use patterns to express changes. • Identifying patterns can help in predicting future values and understanding mathematical concepts. • Patterns can be found in various disciplines, linking mathematics to real-world applications. 	generates, and explains various patterns in real-world contexts.		
H.1.b.	generate patterns to demonstrate a variety of relationships; and	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> • Mathematical patterns are sequences that follow a specific rule or relationship. • Functions describe relationships between variables and often use patterns to express changes. • Identifying patterns can help in predicting future values and understanding mathematical concepts. • Patterns can be found in various disciplines, linking mathematics to real-world applications. 	Teacher candidates will demonstrate their understanding of mathematical patterns by creating a visual project that identifies, generates, and explains various patterns in real-world contexts.	1	1
H.1.c.	relate patterns in one strand of mathematics to patterns	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p>	Teacher candidates will demonstrate their understanding of mathematical patterns by creating a visual project that identifies,	9, 10	1



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	across the discipline	<ul style="list-style-type: none"> • Mathematical patterns are sequences that follow a specific rule or relationship. • Functions describe relationships between variables and often use patterns to express changes. • Identifying patterns can help in predicting future values and understanding mathematical concepts. • Patterns can be found in various disciplines, linking mathematics to real-world applications. 	generates, and explains various patterns in real-world contexts.		
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Learning Opportunities and Assessment for Standards H.1.a., H.1.b., H.1.c.:

FDLTCC Subject Matter: 1, 7, 8, 9, 10

Cultural Standard: 1

ASSESSMENT:

Teacher candidates will demonstrate their understanding of mathematical patterns by creating a visual project that identifies, generates, and explains various patterns in real-world contexts.

KEY POINTS:

- Mathematical patterns are sequences that follow a specific rule or relationship.
- Functions describe relationships between variables and often use patterns to express changes.
- Identifying patterns can help in predicting future values and understanding mathematical concepts.
- Patterns can be found in various disciplines, linking mathematics to real-world applications.

Assessment rubric will be provided to teacher candidates.

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 (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:

MN PELSB Content Standard code	8710.3200 Elementary Education: Subject Matter	Learning opportunities <i>*Include the Field Experience hours as applicable for clarity.</i>	Based on the learning opportunities and assessments, the K-6 learner will demonstrate meeting this standard by: Assessment	FDLTCC Learning Outcomes	Cultural Standard
H.2.a.	help students investigate situations that involve	Textbook readings, presentations, professional articles, videos and field	TCs will complete a project that involves creating a network graph based on a real-world scenario, calculating	2, 4	1



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	counting finite sets, calculating probabilities, tracing paths in network graphs, and analyzing iterative procedures; and	<p>experience observations will include these key points:</p> <ul style="list-style-type: none"> ● Discrete Mathematics: Focuses on countable, distinct values and includes concepts like graph theory and combinatorics. ● Network Graphs: Useful for visualizing relationships and paths within finite sets. ● Counting Techniques: Fundamental for calculating probabilities and understanding combinations and permutations. ● Recursion: A method of defining functions in terms of themselves, important for solving complex problems. ● Problem-Solving: Emphasizes critical thinking and applying mathematical concepts to real-life situations. 	<p>probabilities, and presenting their findings.</p> <p>Examples may include:</p> <ol style="list-style-type: none"> 1. Social Networks 2. Transportation Networks 3. Telecommunication Networks 4. Supply Chain Management 5. Biological Networks 6. Computer Networks 7. Recommendation Systems 8. Epidemiology 		
H.2.b.	apply these ideas and methods in settings as diverse as the mathematics of finance, population dynamics, and optimal planning;	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <p>KEY POINTS:</p> <ul style="list-style-type: none"> ● Discrete Mathematics: Focuses on countable, distinct values and includes concepts like graph theory and combinatorics. ● Network Graphs: Useful for visualizing relationships and paths within finite sets. ● Counting Techniques: Fundamental for 	<p>TCs will complete a project that involves creating a network graph based on a real-world scenario, calculating probabilities, and presenting their findings.</p> <p>Examples may include:</p> <ol style="list-style-type: none"> 1. Social Networks 2. Transportation Networks 3. Telecommunication Networks 4. Supply Chain Management 5. Biological Networks 6. Computer Networks 	2, 4	1



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		<p>calculating probabilities and understanding combinations and permutations.</p> <ul style="list-style-type: none"> ● Recursion: A method of defining functions in terms of themselves, important for solving complex problems. ● Problem-Solving: Emphasizes critical thinking and applying mathematical concepts to real-life situations. 	<p>7. Recommendation Systems 8. Epidemiology</p>		
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Learning Opportunities and Assessment for Standard H.2.a., H.2.b.:
 FDLTCC Subject Matter: 2, 4
 Cultural Standard: 1
LEARNING OBJECTIVE:
 TCs will be able to investigate and solve problems related to discrete mathematics, including counting finite sets, calculating probabilities, tracing paths in network graphs, and analyzing iterative procedures.
ASSESSMENTS:
 TCs will complete a project that involves creating a network graph based on a real-world scenario, calculating probabilities, and presenting their findings.
KEY POINTS:

- **Discrete Mathematics:** Focuses on countable, distinct values and includes concepts like graph theory and combinatorics.
- **Network Graphs:** Useful for visualizing relationships and paths within finite sets.
- **Counting Techniques:** Fundamental for calculating probabilities and understanding combinations and permutations.
- **Recursion:** A method of defining functions in terms of themselves, important for solving complex problems.
- **Problem-Solving:** Emphasizes critical thinking and applying mathematical concepts to real-life situations.

Assessment rubric will be provided to teacher candidates.

3. concepts of numerical literacy:

3.a.	possess number sense and be able to use numbers to quantify concepts in the students' world;	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> ● Understanding number sense: Recognizing the value of numbers and their practical applications in real-world contexts. ● Exploring computational procedures: Applying various methods to 	<p>Assessment Part 1: Mathematical Content Knowledge Part 2: Pedagogical Content Knowledge Teaching Number Relationships Part 3: Professional Practice Project- Number Theory Exploration and presentation</p>	1, 2	5
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		<p>solve problems and checking the reasonableness of answers.</p> <ul style="list-style-type: none"> • Concepts of number theory: Identifying and working with factors, multiples, prime numbers, and divisibility rules. • Relationships among integers: Understanding properties of integers and how they relate to other mathematical domains. 			
3.b.	<p>understand a variety of computational procedures and how to use them in examining the reasonableness of the students' answers;</p>	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> • Understanding number sense: Recognizing the value of numbers and their practical applications in real-world contexts. • Exploring computational procedures: Applying various methods to solve problems and checking the reasonableness of answers. • Concepts of number theory: Identifying and working with factors, multiples, prime numbers, and divisibility rules. • Relationships among integers: Understanding properties of integers 	<p>Assessment Part 1: Mathematical Content Knowledge Part 2: Pedagogical Content Knowledge Teaching Number Relationships Part 3: Professional Practice Project- Number Theory Exploration and presentation</p>	1, 2	5



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		and how they relate to other mathematical domains.			
3.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	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> • Understanding number sense: Recognizing the value of numbers and their practical applications in real-world contexts. • Exploring computational procedures: Applying various methods to solve problems and checking the reasonableness of answers. • Concepts of number theory: Identifying and working with factors, multiples, prime numbers, and divisibility rules. • Relationships among integers: Understanding properties of integers and how they relate to other mathematical domains. 	Assessment Part 1: Mathematical Content Knowledge Part 2: Pedagogical Content Knowledge Teaching Number Relationships Part 3: Professional Practice Project- Number Theory Exploration and presentation	1, 2	5
3.d.	understand the relationships of integers and their properties that can be explored and generalized to	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> • Understanding number sense: Recognizing the value of numbers and their 	Assessment Part 1: Mathematical Content Knowledge Part 2: Pedagogical Content Knowledge Teaching Number Relationships Part 3: Professional Practice Project-Number Theory Exploration and presentation	1, 2	5



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	<p>other mathematical domains;</p>	<p>practical applications in real-world contexts.</p> <ul style="list-style-type: none"> • Exploring computational procedures: Applying various methods to solve problems and checking the reasonableness of answers. • Concepts of number theory: Identifying and working with factors, multiples, prime numbers, and divisibility rules. • Relationships among integers: Understanding properties of integers and how they relate to other mathematical domains. 			
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Learning Opportunities and Assessment for Standard 3.a, 3.b, 3.c., 3.d.:

FDLTCC Subject Matter: 1, 2
Cultural Standard: 5

KEY POINTS:

- Understanding number sense: Recognizing the value of numbers and their practical applications in real-world contexts.
- Exploring computational procedures: Applying various methods to solve problems and checking the reasonableness of answers.
- Concepts of number theory: Identifying and working with factors, multiples, prime numbers, and divisibility rules.
- Relationships among integers: Understanding properties of integers and how they relate to other mathematical domains.

Assessment

Part 1: Mathematical Content Knowledge

Part 2 Pedagogical Content Knowledge - Teaching Number Relationships

Design a hands-on activity using manipulatives to help 4th graders understand the relationship between factors and multiples.

Part 3 Number Theory Concept Exploration and Presentation

Choose ONE of the following number theory concepts to explore in depth:

- Fibonacci sequence and its mathematical properties
- Perfect numbers and their significance
- The Sieve of Eratosthenes method for finding primes
- Modular arithmetic and its applications

Create a presentation (slides, poster, or digital format) that includes:



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- Clear explanation of the concept
 - Mathematical connections
 - Demonstration of computational procedures related to your concept
- Assessment rubric will be provided to teacher candidates.

4. Concepts of space and shape:

4.a.	understand the properties and relationships of geometric figures	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> • Understanding the fundamental properties of geometric figures (e.g., angles, sides, symmetry). • Utilizing geometric tools effectively to create and analyze figures. • Identifying real-world applications of geometric concepts (e.g., architecture, engineering). • Exploring relationships between different geometric figures (e.g., congruence, similarity). 	TCs will complete a project (Wigwametry) where they create a geometric model using various tools (geoboards, compass, ruler, etc.) and present their findings on the properties of the figures and their applications in real life.	5, 9, 10	6
4.b.	understand geometry and measurement from both abstract and concrete perspectives and identify real world applications; and	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> • Understanding the fundamental properties of geometric figures (e.g., angles, sides, symmetry). • Utilizing geometric tools effectively to 	TCs will complete a project (Wigwametry) where they create a geometric model using various tools (geoboards, compass, ruler, etc.) and present their findings on the properties of the figures and their applications in real life.	5, 9, 10	6



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		<p>create and analyze figures.</p> <ul style="list-style-type: none"> Identifying real-world applications of geometric concepts (e.g., architecture, engineering). Exploring relationships between different geometric figures (e.g., congruence, similarity). 			
4.c.	<p>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;</p>	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> Understanding the fundamental properties of geometric figures (e.g., angles, sides, symmetry). Utilizing geometric tools effectively to create and analyze figures. Identifying real-world applications of geometric concepts (e.g., architecture, engineering). Exploring relationships between different geometric figures (e.g., congruence, similarity). 	<p>TCs will complete a project (Wigwametry) where they create a geometric model using various tools (geoboards, compass, ruler, etc.) and present their findings on the properties of the figures and their applications in real life.</p>	5, 9, 10	6

Learning Opportunities and Assessment for Standard 4.a., 4.b., 4.c.:
 FDLCC Subject Matter: 5, 9, 10
 Cultural Standard: 6
LEARNING OBJECTIVE:
 TCs will be able to analyze and apply the properties and relationships of geometric figures using appropriate tools and real-world applications.



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ASSESSMENTS:

TCs will complete a project where they create a geometric model using various tools (geoboards, compass, ruler, etc.) and present their findings on the properties of the figures and their applications in real life. (**Wigwametry**)

KEY POINTS:

- Understanding the fundamental properties of geometric figures (e.g., angles, sides, symmetry).
- Utilizing geometric tools effectively to create and analyze figures.
- Identifying real-world applications of geometric concepts (e.g., architecture, engineering).
- Exploring relationships between different geometric figures (e.g., congruence, similarity).

Assessment rubric will be provided to teacher candidates.

5. data investigations:

5.a.	use a variety of conceptual and procedural tools for collecting, organizing, and reasoning about data;	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> • Statistics vs. Mathematics: Statistics focuses on data collection, analysis, and interpretation, while mathematics is broader, dealing with numbers and operations. • Data Collection Techniques: Techniques include surveys, experiments, and observational studies. • Analyzing Data: Students will learn how to use graphs and charts to represent data visually. • Qualitative vs. Quantitative Data: Understand the difference and when to use each type. • Importance of Data Communication: how to present findings clearly and effectively 	Teacher Candidates will design a data investigation appropriate for a specific elementary grade level, demonstrating understanding of the statistical process, age-appropriate techniques, and effective communication strategies	4, 5, 7, 9, 10	5
5.b.	apply numerical and graphical techniques for	Textbook readings, presentations, professional articles, videos and field	Teacher Candidates will design a data investigation appropriate for a specific elementary grade level, demonstrating	4, 5, 7, 9, 10	5



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	representing and summarizing data;	<p>experience observations will include these key points:</p> <ul style="list-style-type: none"> ● Statistics vs. Mathematics: Statistics focuses on data collection, analysis, and interpretation, while mathematics is broader, dealing with numbers and operations. ● Data Collection Techniques: Techniques include surveys, experiments, and observational studies. ● Analyzing Data: Students will learn how to use graphs and charts to represent data visually. ● Qualitative vs. Quantitative Data: Understand the difference and when to use each type. ● Importance of Data Communication: how to present findings clearly and effectively 	understanding of the statistical process, age-appropriate techniques, and effective communication strategies		
5.c.	interpret and draw inferences from data and make decisions in a wide range of applied problem situations; and	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> ● Statistics vs. Mathematics: Statistics focuses on data collection, analysis, and interpretation, while mathematics is broader, dealing with numbers and operations. ● Data Collection Techniques: Techniques include surveys, experiments, and observational studies. 	Teacher Candidates will design a data investigation appropriate for a specific elementary grade level, demonstrating understanding of the statistical process, age-appropriate techniques, and effective communication strategies	4, 5, 7, 9, 10	5



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		<ul style="list-style-type: none"> ● Analyzing Data: Students will learn how to use graphs and charts to represent data visually. ● Qualitative vs. Quantitative Data: Understand the difference and when to use each type. ● Importance of Data Communication: how to present findings clearly and effectively 			
5.d.	help students understand quantitative and qualitative approaches to answering questions and develop students' abilities to communicate mathematically	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> ● Statistics vs. Mathematics: Statistics focuses on data collection, analysis, and interpretation, while mathematics is broader, dealing with numbers and operations. ● Data Collection Techniques: Techniques include surveys, experiments, and observational studies. ● Analyzing Data: Students will learn how to use graphs and charts to represent data visually. ● Qualitative vs. Quantitative Data: Understand the difference and when to use each type. ● Importance of Data Communication: how to present findings clearly and effectively 	Teacher Candidates will design a data investigation appropriate for a specific elementary grade level, demonstrating understanding of the statistical process, age-appropriate techniques, and effective communication strategies	4, 5, 7, 9, 10	5

Learning Opportunities and Assessment for Standard 5.a., 5.b., 5.c., 5.d.,:
FDLCC Subject Matter: 4, 5, 7, 9, 10



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Cultural Standard: 5

LEARNING OBJECTIVE:

Students will be able to explain the differences between statistics and mathematics, describe data collection techniques, and analyze data using appropriate methods.

ASSESSMENTS:

Students will complete a project that involves collecting a dataset, analyzing it using both quantitative and qualitative methods, and presenting their findings. They will be assessed on their ability to effectively communicate their results.

- **Statistics vs. Mathematics:** Statistics focuses on data collection, analysis, and interpretation, while mathematics is broader, dealing with numbers and operations.
- **Data Collection Techniques:** Techniques include surveys, experiments, and observational studies.
- **Analyzing Data:** Students will learn how to use graphs and charts to represent data visually
- **Qualitative vs. Quantitative Data:** Understand the difference and when to use each type.
- **Importance of Data Communication:** how to present findings clearly and effectively.

Assessment rubric will be provided to teacher candidates.

6. concepts of randomness and uncertainty:

6.a.	probability as a way of describing chance in simple and compound events; and	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> ● Probability Basics: Understand the difference between theoretical and empirical probability. ● Simple and Compound Events: Define and distinguish between simple events (single outcomes) and compound events (multiple outcomes). ● Random Sampling: Explain the importance of randomness in sampling for experimental studies. ● Law of Large Numbers: Discuss how larger sample sizes can lead to more accurate 	TCs will complete a probability analysis assignment that includes calculating probabilities for simple and compound events, interpreting results, and discussing the implications of randomness in data sampling	7, 8, 10	1, 5
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		representations of probabilities.			
6.b.	the role of randomness and sampling in experimental studies;	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> ● Probability Basics: Understand the difference between theoretical and empirical probability. ● Simple and Compound Events: Define and distinguish between simple events (single outcomes) and compound events (multiple outcomes). ● Random Sampling: Explain the importance of randomness in sampling for experimental studies. ● Law of Large Numbers: Discuss how larger sample sizes can lead to more accurate representations of probabilities. 	TCs will complete a probability analysis assignment that includes calculating probabilities for simple and compound events, interpreting results, and discussing the implications of randomness in data sampling	7, 8, 10	1, 5

Learning Opportunities and Assessment for Standard 6.a., 6.b.:
 FDLTCC Subject Matter: 7, 8, 10
 Cultural Standard: 1,5
LEARNING OBJECTIVE:
 TCs will be able to describe and analyze concepts of randomness and uncertainty through probability in both simple and compound events, while understanding the role of randomness in experimental studies.
ASSESSMENTS:
 TCs will complete a probability analysis assignment that includes calculating probabilities for simple and compound events, interpreting results, and discussing the implications of randomness in data sampling.
KEY POINTS:

- **Probability Basics:** Understand the difference between theoretical and empirical probability.
- **Simple and Compound Events:** Define and distinguish between simple events (single outcomes) and compound events (multiple outcomes).



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- **Random Sampling:** Explain the importance of randomness in sampling for experimental studies.
 - **Law of Large Numbers:** Discuss how larger sample sizes can lead to more accurate representations of probabilities.
- Assessment rubric will be provided to teacher candidates.

7. Mathematical processes:

7.a	know how to reason mathematically, solve problems, and communicate mathematics effectively at different levels of formality;	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> ● Understanding mathematical reasoning and its importance in problem-solving. ● Real-world applications of mathematical concepts, connecting them to other fields such as science and economics. ● Effective communication of mathematical ideas at varying levels of formality. ● The role of problem-solving strategies in everyday situations. ● Key vocabulary: reasoning, problem-solving, communication, connections. 	TCs will complete a project that involves solving a real-world problem using mathematical reasoning and presenting their findings effectively, demonstrating their understanding of the connections among mathematical concepts and procedures	7, 8, 10	1, 5
7.b	understand the connections among mathematical concepts and procedures, as well as their application to the real world;	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> ● Understanding mathematical reasoning and its importance in problem-solving. ● Real-world applications of mathematical concepts, connecting them to other fields such as science and economics. 	TCs will complete a project that involves solving a real-world problem using mathematical reasoning and presenting their findings effectively, demonstrating their understanding of the connections among mathematical concepts and procedures	7, 8, 10	1, 5



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		<ul style="list-style-type: none"> ● Effective communication of mathematical ideas at varying levels of formality. ● The role of problem-solving strategies in everyday situations. ● Key vocabulary: reasoning, problem-solving, communication, connections. 			
7.c	understand the relationship between mathematics and other fields; and	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> ● Understanding mathematical reasoning and its importance in problem-solving. ● Real-world applications of mathematical concepts, connecting them to other fields such as science and economics. ● Effective communication of mathematical ideas at varying levels of formality. ● The role of problem-solving strategies in everyday situations. ● Key vocabulary: reasoning, problem-solving, communication, connections. 	TCs will complete a project that involves solving a real-world problem using mathematical reasoning and presenting their findings effectively, demonstrating their understanding of the connections among mathematical concepts and procedures		
7.d	understand and apply problem solving, reasoning, communication, and connections; and	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> ● Understanding mathematical reasoning and its importance in problem-solving. 	TCs will complete a project that involves solving a real-world problem using mathematical reasoning and presenting their findings effectively, demonstrating their understanding of the connections among	7, 8, 10	1, 5



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		<ul style="list-style-type: none"> ● Real-world applications of mathematical concepts, connecting them to other fields such as science and economics. ● Effective communication of mathematical ideas at varying levels of formality. ● The role of problem-solving strategies in everyday situations. ● Key vocabulary: reasoning, problem-solving, communication, connections. 	mathematical concepts and procedures		
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Learning Opportunities and Assessment for Standard 7.a., 7.b., 7.c., 7.d.:
 FDLTCC Subject Matter: 7, 8, 10
 Cultural Standard: 1, 5
 Mathematical Processes in Real-World Applications
LEARNING OBJECTIVE:
 TCs will be able to reason mathematically, solve complex problems, and communicate mathematical concepts effectively, understanding their real-world applications.
ASSESSMENTS:
 TCs will complete a project that involves solving a real-world problem using mathematical reasoning and presenting their findings effectively, demonstrating their understanding of the connections among mathematical concepts and procedures.
KEY POINTS:

- Understanding mathematical reasoning and its importance in problem-solving.
- Real-world applications of mathematical concepts, connecting them to other fields such as science and economics.
- Effective communication of mathematical ideas at varying levels of formality.
- The role of problem-solving strategies in everyday situations.
- Key vocabulary: reasoning, problem-solving, communication, connections.

Assessment rubric will be provided to teacher candidates.

8. Mathematical perspectives: History and Technology

8a	understand the history of mathematics and the interaction between different cultures and mathematics; and	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> ● The historical evolution of mathematical concepts across different cultures (e.g., Anishinaabe ,Ancient 	TCs will research a specific cultural contribution to mathematics made by the Anishinaabe and create a presentation to share their findings.	5, 6	1
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		<p>Egypt, Greece, China, and India).</p> <ul style="list-style-type: none"> • The role of technology (e.g., calculators, software) in modern mathematical practices compared to traditional tools (e.g., abacus, slide rules). • Examples of cross-cultural mathematical ideas and their interactions (e.g., the concept of zero, algebra). • The importance of recognizing bias in mathematical history and contributions from diverse cultures. 			
8b	know how to integrate technological and nontechnological tools with mathematics	<p>Textbook readings, presentations, professional articles, videos and field experience observations will include these key points:</p> <ul style="list-style-type: none"> • The historical evolution of mathematical concepts across different cultures (e.g., Anishinaabe, Ancient Egypt, Greece, China, and India). • The role of technology (e.g., calculators, software) in modern mathematical practices compared to traditional tools (e.g., abacus, slide rules). • Examples of cross-cultural mathematical ideas and their interactions (e.g., the concept of zero, algebra). • The importance of recognizing bias in mathematical history and 	TCs will research a specific cultural contribution to mathematics made by the Anishinaabe and create a presentation to share their findings.	5, 6	1



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		contributions from diverse cultures.			
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Learning Opportunities and Assessment for Standard 8.a, 8.b.:
 FDLTCC Subject Matter: 5, 6
 Cultural Standard: 1
LEARNING OBJECTIVE:
 TCs will be able to understand the historical context of mathematics and the interactions between different cultures and mathematics, as well as how to integrate technological and non-technological tools with mathematics.
ASSESSMENT:
 TCs will research a specific cultural contribution to mathematics made by the Anishinaabe and create a presentation to share their findings.

- Scaffold questions:
 - What was the mathematical concept?
 - How did this culture use technology in its application?
 - What are the implications of this concept today?

KEY POINTS:

- The historical evolution of mathematical concepts across different cultures (e.g., Ancient Egypt, Greece, China, and India).
- The role of technology (e.g., calculators, software) in modern mathematical practices compared to traditional tools (e.g., abacus, slide rules).
- Examples of cross-cultural mathematical ideas and their interactions (e.g., the concept of zero, algebra).
- The importance of recognizing bias in mathematical history and contributions from diverse cultures.

Assessment rubric will be provided to teacher candidates.

Requirements and Points:

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

Grade	%	Points
A	100-90	1020-918
B	89-80	917-816
C	79-70	815-714
D	69-60	713-612

Course Requirements/Assessment Descriptions/Schedule:

Module	Learning Activities	Assessments	Points	Suggested due date	SEPS	FDLTCC subject matter	Cultural standard



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Module 1 Teaching Math Equitably to all Students	Learning Activities will include: TCs will be able to differentiate between modifications and accommodations, describe components of multitiered systems of support, explain culturally responsive instruction, apply knowledge for working with gifted students, and illustrate approaches to develop resilience in mathematics	Development of a culturally responsive lesson plan that integrates academic vocabulary and attends to students' mathematical identities.	50		1.D.	1,5	1,6
Module 2 Data Investigations	MDE Teaching Data Standards Interactive Data Presentation Introduction to Slow Reveal Graphs Teaching Method Read about Slow Reveal Graphs and their value Elementary Slow Reveal Graphs Teaching Resources Video about slow reveal graphs Slow Reveal Teaching Lesson-Less time between natural disasters Slow Reveal Slide Deck Presentation for Natural Disasters Graph Slow Reveal	<p>Students will utilize information presented to learn about MDE Data Standards and Best Practice Teaching strategies.</p> <p>Teacher Candidates will design a data investigation appropriate for a specific elementary grade level, demonstrating understanding of the statistical process, age-appropriate techniques, and effective communication strategies.</p>	50		5.a. 5.b. 5.c. 5.d.	4,5,7,9, 10	5
Module 3 Data Investigations	Utilizing the Data Investigations Resources Presented in class and using the Data Investigations organizational outline (also presented in class) Teacher	Teacher Candidates will design a data investigation appropriate for a specific elementary	100		5.a. 5.b. 5.c. 5.d.	4,5,7,9, 10	5



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	Candidates will design a data investigation appropriate for a specific elementary grade level, demonstrating understanding of the statistical process, age-appropriate techniques, and effective communication strategies.	grade level, demonstrating understanding of the statistical process, age-appropriate techniques, and effective communication strategies.					
Module 4 Numerical Literacy in Daily Life	MDE Anchor Standard 5 Number Relationships Presentation Concepts of Numerical Literacy Presentation	Mathematical Content Knowledge Assessment	40		3.a. 3.b. 3.c. 3.d.	1, 2	5
Module 5 Instructional Routines for Numerical Literacy	Mathematical Instructional Routines for Effective Teaching Understanding Problem Strings and Resources: https://www.mathisfigureoutable.com/blog/problem-string https://www.therecoveringtraditionalist.com/number-strings/ https://www.mathisfigureoutable.com/problemstrings https://www.mathisfigureoutable.com/blog Number Talks Overview and resources http://www.meaningfulmathmoments.com/number-talks.html https://mathathome.mathlearningcenter.org/ Same and Different Analysis Choral Counting	Pedagogical Content Knowledge Assessment: Teaching Number Relationships-Design a hands-on activity using manipulatives to help 4th graders understand the relationship between factors and multiples	30		3.a. 3.b. 3.c. 3.d.	1, 2	5



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<p>Module 6</p> <p>Assessing Numerical Literacy</p>	<p>Review of Numerical Literacy</p> <p>Number Theory Exploration, Exploration and Assessment</p>	<p>Assessment:</p> <p>Number Theory Concept Exploration and Presentation</p> <p>Choose ONE of the following number theory concepts to explore in depth:</p> <ul style="list-style-type: none"> • Fibonacci sequence and its mathematical properties • Perfect numbers and their significance • The Sieve of Eratosthenes method for finding primes • Modular arithmetic and its applications <p>Create a presentation (slides, poster, or digital format) that includes:</p> <ul style="list-style-type: none"> • Clear explanation of the concept • Mathematical connections • Demonstration of computational procedures related to your concept 	<p>30</p>	<p>3.d</p>	<p>1,2</p>	<p>5</p>
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Module 7	Student Attitude Survey	<p>Assessment:</p> <ul style="list-style-type: none"> In conjunction with your host teacher, create a field observation schedule. Document your observation hours and activities in Watermark. Behave in a professional manner, under the direction of your host teacher. Field Hours 1 and 2- Observe your host teacher Field Hours 3-9 Please interact 1 on 1 or in small groups with students in the classroom during their math time, as your host teacher requests. Ask host teacher the interview questions provided by the course instructor. Field hour observation 10- 1:1 elementary student math attitude interview. Fill out a Math Field Experience checklist (provided by instructor) 2 times during your field placement Hours 11-13: teach an age-appropriate math lesson on a math topic which integrates what the students are 	20- teacher interview					
Field	Teacher Interview			50- Student attitude survey				
Experience	Observation Checklist			150- (3)field observati on checklists				
	Field Experience Fact Sheet			100- Field lesson plan and reflection				



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		<p>currently learning in math class. Meet with your host teacher for a post lesson reflection-how did the lesson go?</p> <p>Number of Hours required:</p> <p>13 hours</p>					
Module 8 Patterns and Functions	<p>Patterns and functions presentation</p> <p>Exploring patterns</p> <p>Understanding patterns</p>	<p>Teacher candidates will demonstrate their understanding of mathematical patterns by creating a visual project that identifies, generates, and explains various patterns in real-world contexts.</p>	50		<p>H.1.a.</p> <p>H.1.b.</p> <p>H.1.c.</p>	1,7,8,9, 10	1
Module 9 Assessment	<p>Assessment Types and Strategies</p> <p>Textbook-Chapter 5</p> <p>Creating Assessments for Learning</p>	<p>Assessment Q and A</p> <p>Midterm test</p> <p>Show what you know!</p> <p>TCs will complete an assessment which evaluates their understanding of assessment strategies for K-6 mathematics education aligned with Minnesota Academic Standards.</p> <p>TCs will create a comprehensive assessment plan that includes both formal and informal assessment strategies tailored to meet the needs of</p>	100		<p>3.A.</p> <p>3.F.</p> <p>4.C.</p>	1,2,3	5



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		diverse learners. They will present this plan in a group setting and provide a rationale for their selected strategies.					
Module 10 Discrete Math/Algebra	<p>KEY POINTS:</p> <ul style="list-style-type: none"> ● Discrete Mathematics: Focuses on countable, distinct values and includes concepts like graph theory and combinatorics. ● Network Graphs: Useful for visualizing relationships and paths within finite sets. ● Counting Techniques: Fundamental for calculating probabilities and understanding combinations and permutations. ● Recursion: A method of defining functions in terms of themselves, important for solving complex problems. <p>Problem-Solving: Emphasizes critical thinking and applying mathematical concepts to real-life situations.</p>	<p>TCs will complete a project that involves creating a network graph based on a real-world scenario. Here are some real-world examples of network graphs for example:</p> <p>Social Networks, Transportation Networks, Telecommunication Networks, Supply Chain Management, Biological Networks or Computer Networks.</p>	100		H.2.a. H.2.b.	2, 4	1
Module 11 Measurement	<p>Measurement presentation Textbook Chapter 18 Teaching Measurement concepts K-6</p>	<p>TCs will create a measurement lesson presentation</p>	50				
Module 12 Geometry	<p>Geometry Presentation Textbook Chapter 19 Wigwametry Unit and Background information</p>	<p>Create a Wigwametry Lesson Plan for elementary students</p> <p>Using the Wigwametry information provided, build your own wigwam model and use the</p>	50		4.a. 4.b. 4.c.	5, 9,10	6



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		wigwammetry Checklist to complete/answer the mathematics concepts/questions involved					
Module 13 Probability	Textbook readings, presentations, professional articles, videos and field experience observations will include these key points: <ul style="list-style-type: none"> ● Probability Basics: Understand the difference between theoretical and empirical probability. ● Simple and Compound Events: Define and distinguish between simple events (single outcomes) and compound events (multiple outcomes). ● Random Sampling: Explain the importance of randomness in sampling for experimental studies. <p>Law of Large Numbers: Discuss how larger sample sizes can lead to more accurate representations of probabilities.</p>	TCs will complete a probability analysis assignment that includes calculating probabilities for simple and compound events, interpreting results, and discussing the implications of randomness in data sampling	50		6.a. 6.b.	7,8,10	1,5
Module 14 History and Technology	TCs will research a specific cultural contribution to mathematics made by the Anishinaabe and create a presentation to share their findings.	TCs will research a specific cultural contribution to mathematics made by the Anishinaabe and create a presentation to share their findings. <ul style="list-style-type: none"> ● Scaffold questions: 		50	8.a. 8.b.	5,6	1



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		<ul style="list-style-type: none"> ○ What was the mathematical concept? ○ How did this culture use technology in its application? ○ What are the implications of this concept today? 					
Module 15 Mathematical Perspectives	<ul style="list-style-type: none"> ● Understanding mathematical reasoning and its importance in problem-solving. ● Real-world applications of mathematical concepts, connecting them to other fields such as science and economics. ● Effective communication of mathematical ideas at varying levels of formality. ● The role of problem-solving strategies in everyday situations. <p>Key vocabulary: reasoning, problem-solving, communication, connections.</p>	TCS will complete a project that involves solving a real-world problem using mathematical reasoning and presenting their findings effectively, demonstrating their understanding of the connections among mathematical concepts and procedures		50	7.a. 7.b. 7.c. 7.d.	7,8,10	1,5

Field Experience:

The following are the items you should complete during your 13 math field work hours. Use/complete the checklist 2 times during your field hours and turn in this written form (2 times), along with a summary (in whatever format you choose) of your teacher interview and student interviews.

- In conjunction with your host teacher, create a field observation schedule.
- Document your observation hours and activities in Watermark.



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- Behave in a professional manner, under the direction of your host teacher.
- Field Hours 1 and 2-Observe your host teacher
- Field Hours 3-9 Please interact 1 on 1 or in small groups with students in the classroom during their math time, as your host teacher requests. Ask host teacher the interview questions provided by the course instructor.
- Field hour observation 10- 1:1 elementary student math attitude interview.
- Fill out a Math Field Experience checklist (provided by instructor) 2 times during your field placement
- Hours 11-13: teach an age-appropriate math lesson on a math topic which integrates what the students are currently learning in math class. Meet with your host teacher for a post lesson reflection-how did the lesson go?

Number of Hours required:

13 hours

Expectations of Host Teacher:

- In conjunction with the FDLTCC teacher candidate, create a field observation schedule.
- Field Hours 1 and 2-Observe you (the host teacher)
- Field Hours 3-9 under your direction, please allow the FDLTCC Teacher Candidates (TCs) to work with small groups or 1 on 1 with a student during math time.
- Please allow the teacher candidate to ask math specific questions (provided by FDLTCC instructor).
- Field hour observation 10- Please allow the TC to conduct a math attitude survey with one elementary student.
- Hours 11-13 TC will teach an age-appropriate math lesson on a math topic which integrates what the elementary students are currently learning in math class. Please allow time after the lesson for a post lesson reflection-how did the lesson go?
- Please verify the teacher candidate's field hours in watermark.

Course Instructor & Contact Information:

Kim Peddle

Kimberly.peddle@fdltcc.edu

Academic Honesty and Integrity

The primary academic mission of Fond du Lac Tribal and Community College is the exploration and dissemination of knowledge. Academic honesty and integrity are integral to the academic process. Academic dishonesty, cheating, plagiarism, and collusion are serious offenses which undermine the educational process and the learning experience for the entire college community.

Fond du Lac Tribal and Community College students are expected to understand and adhere to the concept of academic integrity and to the standards of conduct prescribed by the college's policy on Academic Honesty. Students are expected to assume responsibility for their work, and student materials submitted in fulfillment, of course, program, and college academic requirements must represent students' own efforts. Any act of academic dishonesty attempted by a student at Fond du Lac Tribal and Community College is unacceptable and will not be tolerated.



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Violations of academic integrity or other forms of misconduct may result in serious consequences. These can include receiving a failing grade ("F") for the course and may also lead to additional disciplinary actions as outlined by Fond du Lac Tribal and Community College and the Minnesota State system. For full details, please refer to the [Student Code of Conduct Policy](#).

Accessibility Services Notice

Fond du Lac Tribal and Community College is committed to providing equitable access to learning opportunities for all students. The Minnesota Respond, Innovate, Succeed, and Empower (RISE) Act requires our college to clearly write the process and rights of each student in plain language making self-disclosure by a student with a sufficient disability to start the interactive process. The RISE Act still honors and follows the Federal Disabilities laws- ADA and Section 504 of the Rehabilitation Act. FDLTCC provides students with disabilities (e.g., mental health, attentional, learning, chronic health, sensory or physical) reasonable accommodation to participate in educational programs, activities, or services. Students must contact Trish Berger, our Accessibility Coordinator, to create an accommodation plan with reasonable accommodations. The student will decide which courses the accommodations will be used for and give permission for the instructors to receive the accommodations. The student will then have a discussion with the instructor to activate these accommodations. Students requiring accommodations must first complete an intake form and meet with Trish Berger, Accessibility Coordinator, to establish an accommodation plan. She can be reached at trish.berger@fdltcc.edu or 218-879-0864. For more information, please visit <https://fdltcc.edu/student-support/accessibility-services/>

Sexual Violence

Fond du Lac Tribal & Community College (FDLTCC) is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic and dating violence, gender or sex-based bullying and stalking. If you or someone you know has experienced gender or sex-based violence (intimate partner violence, attempted or completed sexual assault, harassment, coercion, stalking, etc.), know that you are not alone. FDLTCC has staff members trained to support survivors in navigating campus life, accessing resources, providing accommodations, assistance completing with protective orders and advocacy. For more information regarding the Campus Security Report, the following link will give you a report on the Clery Compliance and Security Report at FDLTCC: <https://fdltcc.edu/admissions/about-us/policies-reports/campus-security-policies-reports/>. Please be aware that all FDLTCC employees are required to report any incidents of sexual violence and, therefore it cannot guarantee the confidentiality of a report, but it will consider a request for confidentiality and respect it to the fullest extent possible. If you wish to report sexual misconduct or have questions about school policies and procedures regarding sexual misconduct, please contact Lori Driscoll, Executive Human Resources Officer at 218-878-0879/lori@fdltcc or Jesse Stirewalt, Director of Housing and Student Activities at 218-590-3345/jstirewalt@fdltcc.edu.

Student Success—North Star Communication Platform

Student success is at the heart of what Fond du Lac Tribal and Community College staff, faculty and administration strive to achieve. To help support our students in their educational journeys, FDLTCC uses a communication platform called North Star. Students can raise their hands for support, set up appointments with staff and faculty and



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communicate seamlessly with instructors. The college encourages ALL FDLTCC students to use the North Star webpage link to watch video tutorials and to log into the platform to start using its features.

Use of Generative AI (Choose one—See attachment approved by the local MSCF chapter for more details.)

Generative artificial intelligence (AI) refers to artificial intelligence systems that can create original content—such as text, images, audio, or code—by learning patterns from existing data. These models are distinct from traditional AI in that they generate new outputs rather than simply analyzing or classifying information. Increasingly, generative AI is being integrated into everyday programs (Microsoft 365, Google searches, Adobe Creative Suite, etc.) making it harder to identify when you are engaging with these tools.

While generative AI can support learning and creativity, its use raises important ethical, academic, and environmental concerns—including issues of accuracy, bias, authorship, and the significant environmental impact.

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.



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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.

Cultural Standards Woven Together with Professional Outcomes

The unit has adopted the cultural standards of the WINHEC accredited American Indian Programs and adapted them to meet the specific needs of the education unit. Professional outcomes were developed from the cultural standards. Both the cultural standards and the professional outcomes flow from the unit's vision and mission to provide a unique perspective on teaching and learning. The cultural standards and professional outcomes direct the unit's thinking, planning, actions, and initiatives (see figure 1).

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

- 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



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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**

- 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.



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- Listens and responds to community needs and understands cultural norms as opportunities for growth and development.

Professional Outcome: **Transformational Leadership**

- 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 devices as appropriate).

Professional Outcome: **Ethical Practitioner**

- 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.



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- 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

- 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

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.



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- 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: Please list accordingly

Standards of Effective Practice (SEP) 8710.2000

1D. The teacher understands how alignment with a student's cultural background is necessary to make meaningful connections that enable the construction of knowledge and acquisition of skills.

3A. The teacher understands the varying types and multiple purposes of assessment.

3F. The teacher regularly assesses individual and group performance in order to design and modify instruction to meet students' needs in each area of development, including cognitive, linguistic, social, emotional, and physical, and scaffolds the next level of development.

4C. The teacher creates or adapts lessons, unit plans, learning experiences, and aligned assessments based on Minnesota's academic standards, or if unavailable, local, national, or international discipline-specific standards.

Subject Matter Standards: 8710.3200 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



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how to:

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



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- (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.