MAYVILLE STATE UNIVERSITY

Mathematics for Elementary Teachers, Math 277 Syllabus

MATH 277 (10745) 3 Semester Hours Fall 2018

Instructor: Gretchen Peterson **E-mail:** gretchen.fisch@mayvillestate.edu

Hours of Availability: I will be available by appointment as scheduled through e-mail.

Instruction Mode: On Campus

Time Zone: All times indicated throughout this syllabus reflect Central Time (CT).

Learning Management System (LMS) used for this Course: Blackboard

Course Description: A mathematics content course for prospective elementary school teachers. Topics include problem solving, numeration systems, real numbers, number theory, geometry, probability, statistics, and algebra. Math manipulatives are used in this course. (CCN course)

Pre-requisite: MATH 103 or equivalent.

Purpose of the Course: Math for Elementary Teachers is a required course for elementary education majors with a purpose to prepare pre-service teachers to learn to demonstrate proper techniques to solve elementary mathematics problems multiple ways. This course involves integration of manipulatives and technology that play an integral part in the teaching of mathematics at the elementary school level. Critical thinking and problem solving are an important part of this course. Students will demonstrate the ability to show multiple methods of solving elementary mathematics problems, to differentiate instruction based on student abilities, and to write word problems and open ended questions to determine if students understand mathematical concepts.

Conceptual Framework: Teacher education courses are based upon the Conceptual Framework: Reflective Experiential Teacher.

The Reflective Experiential Teacher conceptual framework is based upon a belief that pre-service teachers develop abilities to reflect on current research findings, essential and theoretical knowledge, and appropriate teaching strategies and practices through experience. Application requires learning how to reflect, to question, and test hypothesis. Experiential practices engage students in a variety of clinical, field-based opportunities in which to employ and assess their instructional abilities.

Course Objectives:

1. Students will be able to show through class participation and completion of graded assignments in MyMathLab, video blogs, and exams that they can solve problems containing one or more of the following: reasoning, whole numbers, integers, fractions, decimals, rational and irrational numbers, percentages, algebraic expressions, factors and primes, geometric relationships, length, perimeter, area, graphs, volume, statistics, probability, and metric system. Students will be able to demonstrate more than one way to solve these problems. ***INTASC 4, 5**
2. Students will become familiar with visual models and manipulatives as they collaborate to practice teaching and assessing elementary mathematics concepts using manipulatives and technology. ***INTASC 4, 8, 10**
3. Students will be able to show through class participation and completion of assignments, video blogs, and exams that they understand the needs of diverse learners and can effectively ask questions to determine students' comprehension of particular mathematical concepts. ***INTASC 2, 4, 5, 10**
4. Students will reflect on their previous math experiences as they learn about math anxiety, fixed and growth mindsets, and learning styles. ***INTASC 1, 2, 4, 5, 10**

* The INTASC Standards can be found in the teacher education handbook in Sharepoint on the Mayville State University website and in the table below.

	Interstate New Teacher Assessment and Support Consortium Standards (InTASC)
1	*Learner Development:* The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2	*Learning Differences:* The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards
3	*Learning Environments:* The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4	*Content Knowledge:* The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5	*Application of Content:* The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6	*Assessment:* The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7	*Planning for Instruction:* The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context..
8	*Instructional Strategies:* The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9	*Professional Learning and Ethical Practice:* The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.
10	*Leadership and Collaboration:* The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

Program Student Learning Outcomes (SLOs) Addressed in this Course:

The Academic Program Student Learning Outcomes document can be found in your Blackboard course shell. It contains all learning outcomes pertaining to Essential Studies courses and all majors and minors. The document has an index so you can quickly find the degree you are pursuing.

Mathematics Education Program Student Learning Outcomes (SLOs) Addressed in This Course:

ME SLO 1: Students will acquire a content knowledge base commensurate with career goals.

ME SLO 2: Students will communicate mathematics information both orally and in writing.

ME SLO 3: Students will apply mathematics in context, including at least one experiential situation, to solve problems.

ME SLO 4: Students will construct and critically analyze mathematical arguments.

ME SLO 5: Students will integrate technology appropriate to their major into their work.

Elementary Education Program Student Learning Outcomes (SLOs) Addressed in This Course:

EE SLO 1: *Learner & Learning*: Students understand diversity in learning and developmental processes and create supportive and safe learning environments for students to thrive.

EE SLO 2: *Content*: Students understand subject matter deeply and flexibly so they can advance their students' learning, address misconceptions and apply ideas to everyday life.

EE SLO 3: *Instructional Practice*: Students will plan instruction, utilize effective instructional strategies and technologies, and continuously assess students for mastery and decision-making purposes.

EE SLO 4: *Professional Responsibility*: Students will take responsibility for student learning, collaborative relationships, their own professional growth, and the advancement of the profession.

Course Improvements Based on Most Recent Assessment Findings: This course was not assessed in 2016-17, and the current cycle has ended with a planning year in effect for 2017-19. As a result of the most recent assessment findings, there are opportunities for students to set goals in the discussion boards and to practice and assess problems and solutions to additional practice problems in discussion boards in each unit. This course will be assessed in the future, and findings will be reported in the syllabus.

Required and Recommended Materials:
Required Resource: *MyMathLab for Mathematics for Elementary Teachers* (a 2-year subscription comes with an e-book by Sybilla Beckmann) **Course ID: peterson84138**

Note: Instructions for registering in the course are in Blackboard.

Suggested Resources (not required):

- *Mathematics for Elementary Teachers* (hardcover 3rd or 4th edition or 4th edition loose-leaf paper copy) by Sybilla Beckmann.
- *Hands-On Standards Ready to Teach Mathematics Toolkit, Grades K-9* from hand2mind.com (resources for using manipulatives to introduce math concepts) item #79628.

Instructional Strategies: The instructor will provide an overview of each topic and provide examples to help students solve the assigned practice exercises, graded homework, video blogs, and sample tests to prepare for exams. Students are expected to participate in video blogs via Blackboard and to practice teaching others to master elementary mathematical concepts.

- Practice problems and sample tests are available in Blackboard and/or MyMathLab to allow students to practice additional problems not included in the graded homework. (ME SLO 1 - 3; EE SLO 2, 4)
- Graded homework will be completed in MyMathLab to provide students unlimited attempts to correctly solve each problem as they gain math mastery. (ME SLO 1 - 5; EE SLO 2, 4)
- Students will complete review guides to prepare for exam questions. (ME SLO 1 - 5; EE SLO 1, 2, 4)
- Students will create additional problems for their peers to solve and share in video blogs as they prepare to solve similar problems on exams. (ME SLO 1 - 5; EE SLO 1 - 4)
- Video blogs will be shared via Flipgrid, and students are encouraged to view at least 2 other students' Flipgrids as they learn to communicate mathematical information orally. Students will reflect on their own learning and the learning of others in the course to master content. (ME SLO 1 - 5; EE SLO 1 - 4)
- There will be opportunities for students to practice setting and achieving goals in time management, numeracy, writing word problems, and solving word problems. (ME SLO 1 - 5; EE SLO 1 - 4)
- The instructor will provide detailed feedback on video blogs, exams, and other submitted work. (ME SLO 1 - 5; EE SLO 1 - 4)
- The instructor is available by scheduled appointments, via e-mail. (ME SLO 1 - 5; EE SLO 1 - 4)

Learning Experiences: This course involves integration of manipulatives that play an integral part in the teaching of mathematics at the elementary school level. Critical thinking and problem solving will be an important part of this course.

Students will read text and articles carefully. Students will practice doing problems in each section before completing video blogs, MyMathLab assignments, and exams. Students are encouraged to collaborate as they learn to master the concepts. Practice exams will be provided for each unit. Feedback will be provided on video blogs and exams to help students understand their mistakes.

Instructional Technologies Utilized:

- Blackboard is MSU's learning management system and virtual class environment.
- MyMathLab allows students to practice problems and submit homework using technology.
- Flipgrid allows students to video blog online.
- Graphing calculators, computer software including Wolfram Alpha, and online training resources including Atomic Learning and Khan Academy provide ways for students to utilize technology to understand, solve, and graph solutions to problems.
- Atomic Learning is an online training resource with hundreds of videos available 24/7 and open to all Mayville State University students using their Connect ND credentials.
- These resources may be used as students do homework, but no technology will be allowed as students take exams to demonstrate mastery of elementary mathematical content.

Expectations/Protocols: Becoming proficient in mathematics requires hard work and practice. Students are expected to display academic honesty and respect for themselves, their classmates, their instructor, and the Mathematics department. Students are expected to take notes as they watch the PowerPoint presentations, to ask questions, to do practice problems, to solve graded homework problems using MyMathLab, and to thoughtfully complete reflections through video blogging. Students are expected to communicate using proper mathematical notation and grammar in a legible manner as they show the steps used to determine solutions. Students will demonstrate mastery of concepts on scheduled exams and on a final exam.

Students are responsible to:

- Read text and articles, watch PowerPoint presentations, and complete practice problems.
- Complete graded homework in MyMathLab and video blogs by designated due dates.
- Prepare for exams by practicing problems, submitting questions and solutions within video blogs by showing work as if modeling the work to an elementary student without a calculator.
- Analyze results of practice problems, assigned work, and exams to learn from mistakes and gain mastery of the course content.

Instructor/Student Communication: Students may submit questions or concerns by e-mail to the instructor at gretchen.fisch@mayvillestate.edu. E-mail is checked regularly and the instructor will try to respond to you within 24 hours unless it is on the weekend. Any exceptions to this will be posted in Blackboard Announcements. Students are accountable for all academic communications sent to their Mayville State University e-mail address.

Method of Evaluation/Grading: Students can expect a turnaround time of no more than 72 hours for all graded assignments turned in on time and exams unless posted differently in Blackboard Announcements.

The students in this course will be evaluated on weekly assignments consisting of Flipgrid video blogs in Blackboard and MyMathLab assignments online, unit exams, and a final exam. **(430 points total)**

Grading scale will be calculated as percentage of total points:

A 94 – 100% B 87 – 93% C 80% – 86% D 70 – 79% F < 70%

- **Assignments: 130 points**
    A. **Video Blogging (vlog): (50 points)** Students will be asked to submit ten 90 second video blogs (vlogs) reflecting on learning from that week. Students will do their vlogs using Flipgrid and links will be provided in Blackboard.
    B. **MyMathLab: (80 points)** Students will be asked to complete sixteen MyMathLab assignments on math content learned that week. Students may redo problems answered incorrectly to attain up to 100%.
- **Exams: 200 points** Students will complete 4 unit exams each worth 50 points.
- **Final Exam: 100 points** Students will complete a comprehensive final exam worth 100 points.

Students are encouraged to be prepared to practice concepts during class time and to share their experiences with others to provide more opportunities to master elementary mathematics concepts. Students should expect to spend at least 12 hours per week viewing PowerPoint presentations, doing weekly assignments, and preparing for exams. If you need an extension on any of the deadlines, please submit your request to the instructor by e-mail.

Activity	**No. of Occurrences**	**Points Possible**	**Fraction of Total**
Weekly Assignments (Flipgrid Vlogs & MyMathLab)	14	140	140/430
Exams	4	200	200/430
Final Exam	1	100	100/430

Criteria 5 Points Total	**Insufficient** **1**	**Basic** **2**	**Partially Proficient** **3**	**Proficient** **4**	**Exemplary** **5**
MyMathLab weekly assignments demonstrate concept understanding and are completed with accuracy.	Completes weekly assignment in MyMathLab with <70% accuracy.	Completes weekly assignment in MyMathLab with 70-79% accuracy.	Completes weekly assignments in MyMathLab with 80-86% accuracy.	Completes weekly assignments in MyMathLab with 87-93% accuracy.	Completes weekly assignments in MyMathLab with ≥94% accuracy.

MyMathLab Assignments

Criteria 5 Points Total	**Insufficient** **1**	**Basic** **2**	**Partially Proficient** **3**	**Proficient** **4**	**Exemplary** **5**
Applies course concepts, theories or materials correctly in weekly online video blogs.	Completes, but does not explain or apply relevant course concepts in weekly video blogs.	Online video blogs demonstrate common conversation as compared to academic discussions.	Explains relevant course concepts, theories or materials, but greater application of course content necessary in weekly online video blogs.	Applies relevant course concepts, theories, or materials correctly in the completed weekly online video blogs.	Thoroughly analyzes and applies course concepts, theories, or materials correctly in substantive responses within the week's online video blogs.

Flipgrid Video Blog (Vlog) Assignments

Assignment Grading:
MyMathLab: Grade will be taken at due date/time specified to earn up to 5 points. Grade will also be taken again 1 week after due date/time. This allows students to keep working towards mastery of content. Grade will NOT be reassessed or changed after this unless a student emails the teacher. To encourage students to keep working towards mastery, the MyMathLab assignments will remain open until the course is complete.
Video Blogs (Vlogs): Grade will only be taken at due date/time specified unless you have emailed the instructor for an extension. A maximum of 5 points can be earned at this time.

Extra Credit:
Students can earn 2 extra credit points per additional Flipgrid Vlog submitted. Ten extra credit vlogs are noted on the course timeline/checklist and instructions will be posted on Blackboard. This will allow students to earn up to 20 extra credit points throughout the course.

Proficient 1	Exemplary 2
Applies relevant course concepts, theories, or materials correctly in the completed weekly online video blogs.	Thoroughly analyzes and applies course concepts, theories, or materials correctly in substantive responses within the week's online video blogs.

Late Arrivals: The grading system for students adding this course after the first day of instruction will not be modified. Students will be graded on all the activities regardless of the date of enrollment in the course. Students will not be penalized for late assignments if enrollment occurs after the due date of the assignment, but the students are still responsible for completing the course material that was covered during their initial absence. Arrangements can be made for new due dates.

Diversity: Diversity issues will be addressed whenever appropriate.

Important Student Information: Important student information can be found on the Moodle page for this course under the "Important Student Information" link.

- ✓ Academic Grievance Concerns and Instructor English Proficiency
- ✓ Starfish: Student Success System
- ✓ Students with Documented Disabilities
- ✓ Academic Honesty
- ✓ Emergency Notification
- ✓ Continuity of Academic Instruction for a Pandemic or Emergency
- ✓ Family Educational Rights and Privacy Act of 1974 (FERPA)
- ✓ Diversity Statement

Course Timeline/Checklist: See detailed descriptions in Blackboard "Weekly Modules" section
*Each module opens the Sunday at 8am the week before it is due.

Topic:	Chapter/Lessons:	Assignment Checklist:	Due Date:
8/20-8/26 MODULE			
Intro to Course/ Enrollment Verification		□ Read Syllabus □ Intro Flipgrid Vlog #1	5pm CST Sunday, September 26
Statistics	15.1-15.4	□ Powerpoint □ MyMathLab	5pm CST Sunday, September 26
8/27-9/09 MODULE ***No Class 9/03 Labor**			
Numbers and the Base-Ten System	1.1-1.4	□ Powerpoint □MyMathLab □ Read Furner and Duffy article □ Flipgrid Vlog #2	5pm CST Sunday, September 2
Fractions and Problem Solving	2.1-2.5	□ Powerpoint □ MyMathLab □ Extra Credit Vlog #1	5pm CST Sunday, September 9
9/10-9/16 MODULE			
Addition and Subtraction	3.1-3.5	□ Powerpoint □ MyMathLab □ Read Klassen article □ Flipgrid Vlog #3 □ Extra Credit Vlog #2	5pm CST Sunday, September 16
9/17-9/23 MODULE			
Unit 1 Assessment (Chapters 1, 2, 3, 15)		□ Unit 1 Study Guide □ Unit 1 Exam	5pm CST Sunday, September 23
Number Theory	8.1-8.3	□ Powerpoint □ MyMathLab □ Extra Credit Vlog #3	

9/24-9/30 MODULE			
Multiplication	4.1-4.6	□ Powerpoint □ MyMathLab □ Read Smith, Marchand-Martella, & Martella article on Rocket Math □ Flipgrid Vlog #4 □ Extra Credit Vlog #4	5pm CST Sunday, September 30
10/01-10/07 MODULE			
Multiplication of Fractions, Decimals, and Negative Numbers	5.1-5.4	□ Powerpoint □ MyMath Lab □ Flipgrid Vlog #5 □ Extra Credit Vlog #5	5pm CST Sunday, October 7
10/08-10/14 MODULE			
Probability	16.1-16.4	□ Powerpoint □ MyMath Lab □ Watch RSA Animate on Dweck's Fixed and Growth Mindset video □ Flipgrid Vlog #6	5pm CST Sunday, October 14
10/15-10/21 MODULE			
Unit 2 Assessment (Chapters 4, 5, 8, 16)		□ Unit 2 Study Guide □ Unit 2 Exam	5pm CST Sunday, October 21
Division	6.1-6.6	□ Powerpoint □ MyMath Lab □ Extra Credit Vlog #6	
10/22-10/28 MODULE			
Ratio and Proportional Relationships	7.1-7.5	□ Powerpoint □ MyMath Lab □ Read Cornell's I Hate Math article □ Flipgrid Vlog #7	5pm CST Sunday, October 28
10/29-11/04 MODULE ***No Class Nov. 5th** **Ms. Peterson has conferences**			
Algebra	9.1-9.7	□ Powerpoint □ MyMath Lab □ Extra Credit Vlog #7	5pm CST Sunday, November 4
11/05- 11/18 MODULE ***No Class 11/12** **Veteran's Day**			
Area of Shapes	12.1-12.9	□ Powerpoint □ MyMath Lab □ Read Dweck's article on teachers' mindsets □ Flipgrid Vlog #8	5pm CST Sunday, November 11
Geometry	10.1-10.4	□ Powerpoint □ MyMath Lab □ Extra Credit Vlog #8	5pm CST Sunday, November 18
11/19-11/25 MODULE			
Unit 3 Assessment (Chapters 6, 7, 9, 10, 12)		□ Unit 3 Study Guide □ Unit 3 Exam	5pm CST Sunday, November 25
Measurement	11.1-11.4	□ Powerpoint □ MyMath Lab □ Extra Credit Vlog #9	

11/26-12/02 MODULE			
Solid Shapes and Their Volume & Surface Area	13.1-13.4	□ Powerpoint □ MyMath Lab □ Read Dweck's article on revisit of growth mindset □ Flipgrid Vlog #9	5pm CST Sunday, December 2
Geometry of Motion and Change	14.1-14.7	□ Powerpoint □ MyMath Lab □ Extra Credit Vlog #10	
12/3-12/10 MODULE			
Unit 4 Assessment (Chapters 11, 13, 14)		□ Unit 4 Study guide □ Unit 4 Exam □ Flipgrid Vlog #10	5pm CST Sunday, December 9
Final Exam			In Class Monday, December 10

References

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