FITCHBURG STATE UNIVERSITY

These top fields will be completed by the SGOCE office.

Academic Year: * 24-25 SGOCE#: * 18

New Graduate Course Proposal

Form Procedure
To share the form with others prior to Submitting choose the **Save Progress** option at the bottom.
Create a PDF of the saved form go to Print and choose Save as PDF copy rather than print.
To access the saved form for editing or to finalize submission visit forms.fitchburgstate.edu to log in and view your Pending/Drafts under My Forms.

Course Title

Course Title: * Advanced Math Pedagogy in the Elementary Classroom

Proposed Banner Abbreviation: * Adv. Math: Curr, Asses,all Lrn

Banner limit of 30 characters, including punctuation, spaces, and special characters.

Department/Committee Information

The main contact person for the Graduate Curriculum Committee should fill out this form.

Requestor Name: * Nancy Murray

Members of the Graduate Curriculum Committee:
Lynn D'Agostino: Chair
Jescah Apamo-Gannon
Dustin Halterman
Nancy Murray
Denise Sargent

Department / Unit Developing: * Education

Department Chair: * Dr. Denise Sargent * dsargen5@fitchburgstate.edu

Academic Dean: Dr. Mojdeh Bayat mbayat@fitchburgstate.edu

Program Chair: The Program Chair for this request is among the people listed above.
* (•) Yes
( ) No

Graduate Program: * Elementary Education

The above program would be responsible for scheduling, staffing & assessing this course.

Course Information

Course Description

* Candidates will develop a deeper knowledge of the Massachusetts Mathematics Curriculum Frameworks and math content in the areas of Mathematical Pedagogy, Algebraic Thinking, Data Analysis and Probability, and Measurement and Geometry, building upon the foundational concepts explored in EDUEDUC 7640: Mathematics: Curriculum, Assessment, Panning, and Teaching for all Learners. Content will be taught using best practices of instructional methodologies for teaching early childhood and elementary mathematics. Shifting of instructional practices to teach Common Core standards will be emphasized as candidates examine, create and model grade level learning activities. Candidates will learn to use data of student learning during specific lessons focused on precise objectives to evaluate their own teaching effectiveness to improve student learning. Candidates will be required to complete 20 hours of field experience.

Course Objectives

Detailed course objectives within the syllabus.
Standard 1: Curriculum, Planning, and Assessment
1. Subject Matter Knowledge
2. Curriculum Literacy
3. Purposeful Assessment
4. Accessible Assessment
6. Analysis and Conclusions

Standard 2: Teaching All Students
7. High Expectations and Support
8. Engaging Instruction

9. Inclusive Instruction
10. Positive Relationships
11. Critical Thinking
12. Reflective Practice
13. Judgment

Rationale and expected outcomes of offering the Course

*The addition of the second mathematics course is to address indepth methodology and content associated with grades 2-6 as well as to meet the 6 credit requirement put forth by the National Council on Teacher Quality (NCTQ,).

What are the Learning Outcomes for the Course?

see above

Number of Credits: * 3

Discipline Prefix or Prefixes: * EDUC

Brief rationale if more than one prefix:

Level of Course: * 7000 / 8000 / 9000

Brief rationale for level choice::
*This is a graduate methods course

The course will be: Requirement / Elective

Elective or Requirement Note/Special:

Is there a similar undergraduate course? * Yes / No

Does this course affect offerings in any other department or program? * Yes / No

Course Enollment

Expected Average Enrollment: * 15-20

This course is a replacement for: Course # / Name

Has the course been offered previously as a "Topics" course? * Yes / No

Is this an Extended Campus Course? * Yes / No

Which semester will this course be offered for the first time?: * Spring 2026

How often thereafter to be offered?:
*once a year

Course Requirements

Prerequisite course(s) if any: EDUC 7003: Educational Issues in Child Development, SPED 7024: Understanding Disabiliti

Additional Requirements

Laboratory Hours:

Fieldwork Hours: 20

Pre-Practicum Hours:

Practicum Hours:

Other Requirements (specify):

Syllabus Upload

New Course Syllabus Upload: EDUC 7XXX- Advanced Math Pedagogy in the Elementary Classroom.docx

Signatures

*Click on the **Submit Form** button at the bottom of the page after you have signed the form.*
You should receive an email confirmation that your signature has been completed.

...3730313239

Nancy Murray — Requester Signature — 02/22/2025 — Date

...3731333031

...3230323631

Moideh Bayat — Academic Dean Signature — 03/17/2025 — Date

...3436303034

Denise Sargent 03/16/2025
Department Chair Approval Date

Becky Copper Glenz 03/21/2025
SGOCE Dean Signature Date

Graduate Council
The Graduate Council Chair Signature indicates that the Council has discussed this proposal and has decided it should move forward.

Graduate Council Chair Signature Date

Notifications

Approval of the President Date

SGOCE Dean Initials Date

Reviewed by the Registrar: Date

FITCHBURG STATE UNIVERSITY

Teacher Education Department
Comprehensive Syllabus

Spring 2026
EDUC 7XXX: Advanced Math Pedagogy in the elementary classroom
3 Credits
Thursdays: 5:00 pm–7:30 pm (OnSync)

Instructor: TBD
Office:
Office Hours:
Phone:
E-mail:

COURSE DESCRIPTION:

Candidates will develop a deeper knowledge of the Massachusetts Mathematics Curriculum Frameworks and math content in the areas of Mathematical Pedagogy, Algebraic Thinking, Data Analysis and Probability, and Measurement and Geometry. Content will be taught using best practices of instructional methodologies for teaching early childhood and elementary mathematics. Shifting of instructional practices to teach Common Core standards will be emphasized as candidates examine, create and model grade level learning activities. Candidates will learn to use data of student learning during specific lessons focused on precise objectives to evaluate their own teaching effectiveness to improve student learning. Candidates will be required to complete 20 hours of field experience.

TEXTS:

Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2019). *Elementary and middle school mathematics: Teaching developmentally* (10th ed.). Boston, MA: Allyn and Bacon.

Additional rsources:

Beckmann, S. (2022). *Mathematics for elementary teachers with activities* (6th ed). Pearson Education, Inc.

Seda, P, & Brown, K. (2021). *Choosing to see: A framework for equity in the math classroom.* Dave Burgess Consulting.

Zager, J. T. (2017). *Becoming the math teacher you wish you had.* Routledge.

Massachusetts Curriculum Framework in Mathematics (2017)
http://www.doe.mass.edu/frameworks/math/2017-06.pdf

Additional references and resources to be determined by the instructor throughout the course
Standards from the following organizations will be reviewed within the course content:

Fitchburg State University Teacher Preparation Programs. (2012). *Conceptual framework.* Fitchburg, MA: Author.

National Council of Teachers of Mathematics. https://www.nctm.org/

National Governors Association Center for Best Practices & Council of Chief State School Officers (2010). *Common core state standards for mathematics.* Washington, D. C.: Authors. https://corestandards.org/

Massachusetts Department of Elementary and Secondary Education: Professional Standards for Teachers (PSTs):

Professional Standards for Teachers (PSTs) addressed in this course.

COURSE OBJECTIVES:

Standard 1: Curriculum, Planning, and Assessment

1. **Subject Matter Knowledge**: Demonstrates sound knowledge of the subject matter by:
   - Using evidence-based pedagogical practices that enable all students to develop and apply grade-level knowledge and skills in authentic contexts.
   - Supporting all students to make connections between the subject matter and real-world issues with impact on their communities and their world.
   - Understanding the difference between social and academic language and the importance of this difference in planning, differentiating, and delivering effective instruction for English learners at various levels of English language proficiency and literacy.
2. **Curriculum Literacy**: Skillfully uses curricular materials by:
   - Determining strengths and weaknesses of materials and adapting as necessary to plan evidence-based, inclusive, and culturally sustaining instruction, including identifying opportunities to create meaningful, relevant connections rooted in the local context.
   - Identifying necessary supplemental resources and/or tiered supports to provide all students access to grade-level instruction.
   - Utilizing a coherent instructional approach that builds student learning towards grade-level standards or individual learning goals over time through aligned lesson goals, scope, sequence, and tasks.
3. **Purposeful Assessment**: Uses a variety of formal and informal assessments for specific instructional purposes, including to:
   - Understand each student's strengths and areas for growth.
   - Measure and monitor students' understanding throughout instruction and their progress toward grade-level standards and/or individual learning goals.
   - Actively inform instructional decisions.
4. **Accessible Assessment:** Implements assessments that are accessible to all students by:
   - Providing multiple ways and opportunities for students to demonstrate their learning.
   - Creating opportunities for students to be able to draw from their cultural and linguistic knowledge and personal experiences.
   - Ensuring that assessment tasks, methods, and instruments maintain the rigor and high expectations outlined in the grade-level standards and do not perpetuate racial, cultural, or linguistic bias.
5. **Analysis and Conclusions:** Analyzes disaggregated data from a wide range of assessments to:

- Gain information about students' progress towards grade-level standards and/or individual learning goals, including trends across students or student groups.
- Reflect on instruction and identify actions to reduce disparate outcomes and improve learning for all students.

Standard 2: Teaching All Students

6. **High Expectations and Support:** Supports all students to meet or exceed high expectations for grade-appropriate, standards-aligned learning, produce high-quality work, and develop self-awareness and skills for independent learning by:

- Using evidence-based, culturally and linguistically sustaining instructional practices to provide equitable opportunities for grade-level learning.
- Providing flexible and responsive supports, scaffolds, and tools to meet students' needs.
- Communicating clear criteria for success (e.g., models, rubrics, exemplars).
- Reinforcing perseverance and effort with challenging content and tasks.

7. **Engaging Instruction:** Engages all students as active participants in learning experiences that are relevant, real-world, and interactive by:

- Providing opportunities for students to make choices, explore topics and apply learning in culturally and linguistically sustaining ways, and through real-world, interactive contexts.
- Building on students' strengths, interests, cultural and linguistic backgrounds, and prior knowledge to support and motivate learning
- Facilitating purposeful student-to-student academic discourse with equitable student participation in discussion.
- Integrating digital tools and educational technology that enhance learning experiences and promotes the development of digital literacy skills.

8. **Inclusive Instruction**: Accommodates and supports individual differences in all students' learning needs, abilities, interests, and levels of readiness, including those of students with disabilities (in accordance with relevant IEPs or 504 plans), English learners and former English learners, academically advanced students, and students who have been historically marginalized, by:

- Using appropriate inclusive practices, such as tiered supports, educational and assistive technologies, scaffolded instruction, and leveraging students' native language and linguistic resources to make grade-level content accessible and affirming for all students.
- Providing students with multiple ways to learn content and demonstrate understanding, as appropriate.

9. **Positive Relationships**: Builds positive, caring relationships to help all students feel valued, respected, equitably supported, and a sense of belonging in the classroom community.

Standard 4: Reflective Practice

10. **Critical Thinking:** Develops students' abilities to think critically, ask questions, and analyze sources, perspectives, and biases in order to deepen learning and make connections between the content and real-world problems and events (e.g., issues of identity, equity, power, and justice).

11. **Reflective Practice:** Reflects on the effectiveness of instruction and how one's identities, biases, and practices impact student learning and well-being; and works to improve practice and eliminate learning inequities across race, gender, ethnicity, language, disability and ability, and other aspects of student identities, such that all students can meet or exceed grade-level standards.

12. **Judgment:** Adheres to the school or district's existing code of ethics and protects student confidentiality appropriately, including student data privacy related to digital tools.

The integration of the following contenet will be also be addaressed in this course:

13. Subject Matter Knowledge:
Support the integration of standards for literacy across the content areas as outlined in the 2017 English Language Arts (ELA)/Literacy Framework.
The following standards from the organizations below will be reviewed within the course content:
2017 Mathematics Curriculum Frameworks (Prek-8)
http://www.doe.mass.edu/frameworks/math/2017-06.pdf
14. United Nations Sustainable Development Goals
Quality education (SDG 4): Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Gender equality (SDG 5): Achieve gender equality and empower all women and girls
Reduced inequalities (SDG 10): Reduce inequality within and among countries

Fitchburg State University Teacher Education Conceptual Framework

Candidates will develop the knowledge, skills, and dispositions of the Conceptual Framework necessary to effectively promote the development of mathematics curriculum, assessment, planning, and teaching of children. They will become aware of specific researched-based skills and instructional practices necessary to support the mathematics development of children, considering and planning modifications and support for English Language Learners (ELLs) and for students with disabilities. Finally, candidates will be able to assess student skills and plan engaging, developmentally appropriate activities that incorporate motivation, authenticity, and enjoyment.

This course will also address the standards of the following organizations: the Massachusetts Department of Elementary and Secondary Education (ESE), the Interstate Teacher Assessment and Support Consortium (InTASC), the National Association for the Education of Young Children (NAEYC), the Association for Childhood Education International (ACEI), the Association for Middle Level Education (AMLE), the Council for Exceptional Children (CEC), and the National Council of Teachers of Mathematics (NCTM).

The specific course objectives are as follows:

Knowledgeable - As a result of the learning experiences in the course, candidates will become more cognizant of the following:

- The fundamental concepts of numbers, integers, and computational operations.
- Algebraic principles.
- The process of problem solving.
- Mathematical arguments, mathematical rigor, and mathematical inquiry.
- Ways to communicate mathematical thinking.
- The role of technology in mathematics.

Skillful - As a result of the learning experiences in the course, candidates will become more prepared to do the following:

- Demonstrate a number of ways to present number concepts involving whole numbers.
- Link conceptual understanding and computational proficiency within whole numbers.
- Develop computational fluency and a well-developed sense of number.
- Explore and analyze patterns, relations, and functions.
- Use a variety of representations of mathematical ideas to support and deepen students' mathematical understanding.

Caring - As a result of the learning experiences in the course, candidates will become more prepared to do the following:

- Create instructional opportunities that are adapted to diverse students.

- Use a variety of teaching strategies that encourage students' development of critical thinking and problem solving.
- Foster active engagement in learning, self motivation, and positive social interaction and to create a supportive learning environment.
- Foster active inquiry, collaboration, and supportive interaction in the classroom.

Ethical - As a result of the learning experiences in the course, candidates will become more prepared to do the following:

- Use formal and informal assessment strategies to plan, evaluate, and strengthen instruction that will promote continuous intellectual, social, emotional, and physical development of *each* student.

Reflective Leader – As a result of the learning experiences in the course, candidates will become a more reflective leader by doing the following:

- Think about and respond to readings and research-based practices in a reading response journal and during class discussions.
- Think about field-based experiences and record observations and reflections in a journal as well as discuss them in class.
- Work with peers and teachers to analyze, prepare, and model best teaching practices in the classroom.

TECHNOLOGY INITIATIVES

Users of the Fitchburg State University computer systems are subject to all applicable federal, state, and international computer laws. Questions regarding regulations may be directed to the office of Information Technology (IT) ext. 4500.

Teacher candidates will utilize technology in the following ways:

- As a research tool;
- As a means of communicating with others;
- As an enhancement tool for the design of lessons and activities;
- As a means of presenting information.

Fitchburg State University Library Online Services

The Amelia V. Gallucci-Cirio Library building will be open to Fitchburg State University students, faculty and staff, Monday – Thursday from 7:30am – 10pm, Friday 7:30am – 5pm and Sunday 3pm – 10pm. The building will be closed on Saturdays. Masks must be worn and social distancing observed.

The Amelia V. Gallucci-Cirio Library is a digital library and offers books, films and articles in digital format available from on-campus and off-campus. Research assistance and classes will be offered virtually. If desired, check-out of physical materials will be contactless.

For research assistance or to ask questions, please go to https://library.fitchburgstate.edu/lets-chat/.

INSTRUCTIONAL STRATEGIES

X Lecture/Presentation
X Discussion/Questioning
_ Laboratory
X Problem Finding/Solving
X Discovery
X Interviewing

X Collaborative Learning Groups
X Reflective Response
X Creating Visual Illustrations of Concepts

X Data Collection and Analysis
X Field Experience
X Role Playing/Simulation
X Independent Learning
_ Field Trip
X Computer Application

X Viewing and/or Listening Followed by Discussion
X Modeling Strategies by Instructor

A balance of lecture, discussion, hands-on activities, and small group projects will be utilized throughout the semester. A lecture format will be used to present current research, to review topics related to instruction, and to demonstrate instructional and assessment techniques. Case studies and collaborative groups will be utilized to support candidate development. Candidates are required to complete a 20-hour pre-practicum experience.

COURSE REQUIREMENTS

1. Class Attendance, Preparedness, and Participation

A. Class Attendance: A major component of this course will involve the instructor modeling effective teaching strategies thus class attendance is integral to your success in the course. As developing professionals, candidates are expected to attend every class, to be on time, and to communicate with the instructor regarding any necessary absences. Absences and tardiness will result in a lower grade. **More than two absences from this course will be reflected in your final grade.** ***Excessive absences will result in a 0 in this course.*** If candidates are running late or need to miss a class due to an emergency or illness, they must to notify the instructor BEFORE the class meeting.

B. Class Preparedness: All candidates are responsible for completing the reading and other assignments listed on the *Course Content/Topics and Assignments* outline, as well as those assignments given in class. Your ability to complete tasks in a timely fashion demonstrates professional maturity and an ability to organize and manage time. You will receive a lower grade for a late assignment unless advanced arrangements have been made with the instructor. Please have your textbook for class.

Timely Submission of Assignments: All candidates are responsible for meeting required deadlines on projects and assignments. You are expected to upload assignments to Blackboard or pass them in during class on the dates listed on the syllabus/schedule. The only exceptions to this policy occur when: (1) a revised due date has been given to the entire class, OR (2) you request, and I approve, a change in the due date *in advance*. If you are unable to complete an assignment on the date it is due, email me in advance of that class. When an assignment is late, and you have not discussed it with me in advance, your grade will be reduced .5 for each class it is late or reduced per the assignment rubric. **All of these behaviors regarding attendance, preparation, and meeting deadlines are critical for successful teaching and thus are factored into the final grade.**

C. Class Participation: Participation in class discussions, group work, and other class activities is expected and required. This includes listening actively to the individual speaking and providing responses and feedback as requested. In-class cooperative learning assignments, short written assignments, and other activities will be assigned as needed to ensure that you master material and are able to demonstrate your mastery. Assignments may be collected and your grade will be consistent with your attendance and your participation in your work

For most assignments you will receive a grading rubric that outlines expectations for the assignment. You should use this sheet to help you develop and refine your assignment.

2. Chapter Quizzes/Reflections
Candidates will take an online quiz after assigned chapter readings in *Elementary and Middle School Mathematics: Teaching Developmentally* to assess understanding. Candidates will also respond to assigned prompts for each chapter. Responses should be posted to Blackboard by the due date.

3. Padlet Wall: *Choosing to See: A Framework for Equity in the Math Classroom.*
Candidates will read the book *Choosing to See: A Framework for Equity in the Math Classroom.* This book explores the key components of an equitable math classroom as well as how teachers can actively work to dismantle systemic biases in their math instruction. Each week, candidates will respond to a specific prompt on Padlet, and respond to at least 2 classmates.

4. Lesson Plan
Candidates will develop a lesson plan based on a math concept that is being taught in their pre-practicum setting. Detailed lesson plan instructions and rubric for the lesson plan will be discussed during class and are available at http://www.fsc.edu/edunit/.

5. Current Issues in Math Education
The educational landscape is constantly in a state of change. Each candidate will share a brief presentation of an important development or topic that has the potential of influencing your future practice and/or learning for your students in the area of mathematics.

6. Final Project
After reading the book *Becoming the Math Teacher You Wish You Had,* candidates will focus on ideas of fostering a "vibrant classroom" where students actively engage with math, embrace mistakes as learning opportunities, connect mathematical concepts to real-world applications, and develop a deeper understanding of mathematical reasoning, using topics discussed in class. Candidates will reflect on their personal practice and prepare a presentation that addresses the following:

- How can the ideas presented in the book be applied to your current teaching practice to create a more engaging math classroom?
- Identify areas where you might need to shift your teaching philosophy based on the book's insights.
- What are some specific strategies you can implement to encourage more student-led mathematical discourse and reasoning?

Detailed directions for this assignment will be given in class.

Additional Course Requirements
A. Computer Literacy Requirement – All assignments must be professionally prepared (completed on a word processor, doubled-spaced, and size 12 font) unless otherwise instructed.
B. Assignment Quality – All written assignments must be edited in accordance with the *Publication Manual of the American Psychological Association, 6th edition* (APA style) unless otherwise instructed. The faculty in the Education Unit of Fitchburg State University expect candidates preparing to be teachers to serve as role models of good oral and written communications. All grades earned will be based in part on the quality of oral presentations and written material.

COURSE EVALUATION POLICIES AND PROCEDURES

In class, you will be evaluated on the degree to which your contribution provides evidence that you have read the material and integrated it with the information from class sessions as well as your active participation during class activities. For other course requirements, specific methods of evaluation will be detailed in class, on assignment instructions, and on exam directions.

Your course grade will be based on the following percentages:

1.	Class Attendance, Preparation, Participation	10%
2.	Chapter Quizzes	10%
3.	Chapter Reflections/Follow-up activities	10%
4.	Current Issue in Math Education	10%
5.	Padlet: *Framework for Equity*	20%
6.	Lesson Plan	10%
7.	Final Project	30%

Grading Policy

FSU Grade	Point Range	Letter Grade
4.0	95-100	A
3.7	92-94	A-
3.5	89-91	A-/B+
3.3	86-88	B+
3.0	83-85	B
2.7	80-82	B-
2.5	77-79	B-/C+
2.3	74-76	C+
2.0	71-73	C
0.0	0-70	F

COURSE POLICIES

Health & Safety Expectations and Protocols Regarding COVID-19

Public health is everyone's responsibility. All students are expected to comply with the rules and precautions implemented by the University, including, but not limited to, wearing face coverings, washing or sanitizing hands, social distancing, monitoring of symptoms, and self- reporting of symptoms or a positive COVID diagnosis. Behaviors that jeopardize the health and safety of the University community will not be tolerated. Students suspected of, or found to be in violation of, the preceding may be immediately removed from the residence halls and/or the University, pending further action. Failure to comply with these rules and precautions implemented in response to COVID-19 is a violation of the University's Code of Conduct and could subject students to sanctions, up to and including expulsion from the University. Consistent with the

university's statement of non-discrimination, Fitchburg State will not tolerate discrimination, profiling, bias, or any form of racial intimidation in conjunction with this or any other COVID-related policies. Any reported incidents will be addressed in accordance with university policy.

Statement on Recordings

This class may use video and audio recordings of faculty and students, both online and in person, to better support learning in a blended format. By enrolling in the course, students are consenting to being recorded in this class and may only withdraw such consent by informing the course instructor in writing. As these recordings may contain intellectual property as well as confidential student information (ex. student names, likenesses), sharing or transferring recordings of such content by any method currently available or any method that may become available in the future is not allowed and copies of such recordings should not be provided to others; uploaded, linked, embedded, or otherwise posted via file-sharing, social media, or other sites or services which could enable anyone to view or hear them who is not currently enrolled in the course; or share them in any other way. Access to video and audio recordings in this class is for personal educational use only and is available only to individuals currently enrolled in the class, unless faculty permission is expressly granted. Recording and/or sharing course materials including video and audio files without the written consent of the course instructor may not only violate university policies (ex.student code of conduct) but also state and federal laws and will be reported to the Dean of Students for further action and/or discipline.

Assistance and Support

If you have questions or concerns about what is being addressed in class or about some aspect of an assignment, do not hesitate to ask the instructor. In addition to the instructor, there are other sources of support (writing skills, math/science skills, counseling, etc.) on campus in the Academic Success Center.

Resubmission of Assignments

If a grade of 2.5 or less is received on a key assignment (Quiz/Test Assessment and Analysis), you are able to resubmit this assignment in order to gain a better understanding of the content and receive a higher grade. However, the redone assignment must be received within two weeks of the initial grade and the two grades (first and second grade) will be averaged together. Please note that this does not apply to final assignments.

Grade Appeal

If you disagree with the evaluation of your work or believe an improper grade has been assigned, an appeal may be followed. Please discuss the matter with the instructor and refer to the FSU Grade Appeal Policy in your Student Handbook. In this class, all assignments may be redone for a higher grade if they are submitted on time.

Academic Integrity Policy

The faculty in the Education Unit at Fitchburg State University expect that work submitted in fulfillment of course requirements will be solely that of the individual candidate (unless otherwise instructed) and all other sources will be cited appropriately. The *Academic Integrity Policy*, as outlined in the Fitchburg State University Undergraduate Catalog under *Undergraduate Academic Policies and Procedures*, will be strictly enforced.

In certain situations, and at the discretion of the instructor, candidates may be permitted to use Artificial Intelligence (AI) tools. However, unless such permission has been granted, candidates should not submit work created by an AI system, including chatbots such as ChatGPT or Bard. The instructor realizes that the AI revolution will bring big changes to schools in the near future and is evaluating practices and policies accordingly as a result. At this time, the instructor remains committed to teaching candidates how to write

effectively and think critically using proven educational methods. AI might evolve into a helpful tool to utilize effectively in teaching the craft of writing, but it should only be used under the guidance of the instructor while this technology is in its infancy and assesses how it evolves.

To the extent such permission to use AI tools has been granted to a candidate for a particular assignment, the candidate is responsible for whatever information is submitted based on the AI inquiry. Such information cannot violate intellectual property laws or contain misinformation or unethical content. A candidate's use of AI tools must be properly documented and cited to stay within university policies on academic integrity.

Copyright Policy

You are reminded that, in preparing handouts for peers or the instructor, reproduction of copyrighted material without permission of the copyright owner is illegal. Such unauthorized copying may violate the rights of the author or publisher. Fitchburg State University adheres to federal laws regarding use of copyrighted materials. See the student handbook for more details.

Policy on Disability

The Office of Disability Services will continue to arrange for academic and other accommodations for students with documented disabilities. The Disability Services staff can meet virtually; students should establish a meeting with a staff member in Disability Services by calling 978-665-4020, or by emailing disabilityserviceslist@fitchburgstate.edu. Office hours for Disability Services are Monday - Friday, 8:30am - 5pm. Students who are in need of a face-to-face meeting to discuss accommodations can identify this when an appointment is scheduled.

Student Affairs/ Dean of Students

The Office of Student Affairs will continue to serve students and the Fitchburg State community. While walk-ins are welcome, appointments are strongly encouraged; office hours are 8:30am - 5pm, Monday - Friday. Most meetings will be held virtually. Appointments can be scheduled by calling 978-665-3130 or emailing studentaffairs@fitchburgstate.edu. Please note that walk-in appointments that require extended time to resolve the issue may be rescheduled for a virtual meeting to address the issue.

Counseling Services

The Office of Counseling Services will continue providing services to enrolled Fitchburg State University students using a "telehealth" platform. Office hours for Counseling Services will remain the same as in prior semesters, during telehealth provision, Monday - Friday, 8:30am - 5pm. Appointments to meet (virtually) with a counselor can be made by calling 978-665-3152, or by sending an email to counselingscheduler@fitchburgstate.edu.
In emergency situations, students should contact University Police at 978-665-3111, dial 911, or seek out emergency care at their local emergency room.

Falcon Bazaar

The Falcon Bazaar Necessity and Food Pantry is located in Hammond G-23 (right next to the Radio Station). It'll house the Bazaar, The Professional Clothing Closet and the Fitchburg Community Outreach Center (Old Volunteer Center). The hours will be Monday–Friday 9 am – 4:30 pm. Donations of food can be brought to the Student Development Office at any time.

COURSE CONTENT/TOPICS/ASSIGNMENTS

Module 1: Algebraic Thinking

Strands
Algebraic Thinking
Mathematical Pedagogy
Standards for Mathematical Practice

Learning outcomes:

- Describe ways to connect number and algebraic thinking, including using properties of the operations to build number sense and procedural fluency.
- Illustrate how to infuse teaching of patterns and functions into K-5,
- Define mathematical modeling and describe grade-appropriate examples of it.
- Formulate and solve equations to solve problems.

Possible Activities:

- Writing Expressions for Dot, Star, and Stick Designs
- Solving Equations by Reasoning About Expressions
- Solving Equations Algebraically with a Pan Balance
- Solving Algebra Word Problems with Strip Diagrams
- Reasoning About Repeating Patterns

Assignments:

1. Quiz/reflection (Chapter 18)
2. Seda & Brown, Chapter 3
3. Zager, Chapters 5, 6
4. Padlet #2

Module 2: Geometric Thinking and Concepts

Strands

Geometry and Measurement
Mathematical Pedagogy
Standards for Mathematical Practice

Learning Outcomes:

- Illustrate approaches that develop students' imagery and visualization skills.
- Identify and describe shapes by their geometric properties.
- Analyze strategies for teaching about shapes and properties.
- Reason about relationships among categories of shapes and organize these categories into hierarchies.
- Identify that the area of a shape is the number of 1-unit-by-1-unit squares it takes to cover a shape exactly without gaps or overlaps.
- Contrasting and Relating the Perimeter and Area of Shapes.

Possible Activities:

- What Are Points, Lines, Line Segments, Rays, and Planes?
- How Are Angles in a Triangle Related?
- Classifying Shapes by Property (triangles, quadrilaterals)
- Using Venn Diagrams to Relate Categories of Quadrilaterals.

Assignments:

1. Quiz/reflection (Chapter 19)
2. Seda & Brown, Chapter 4
3. Zager, Chapters 7, 8
4. Padlet #3

Module 3: Developing Measurement Concepts

Strands

Geometry and Measurement
Mathematical Pedagogy

Standards for Mathematical Practice

Learning Outcomes:

- Describe the measurement process, including the identification and use of nonstandard and standard units, and demonstrate how to estimate measurements.
- Demonstrate how to measure the length of objects.
- Explain the development of area formulas.
- Explain how angles are measured.
- Describe the best model for teaching elapsed time.
- Explain strategies for counting a collection of coins.

Possible Activities:

- Why Do We Need Units and How Do We Interpret the Meaning of Measurements?
- Making and Using a Ruler
- How Are the Metric and U.S. Customary Systems Related?
- Estimate and Measure
- Error and Precision in Measurements
- Measurement Olympics

Assignments:

1. Quiz/reflection (Chapter 18)
2. Seda & Brown, Chapter 5
3. Zager, Chapters 9, 10
4. Padlet #4
5. Lesson Plan

Module 4: Ratios and Proportional Reasoning

Strands
Geometry and Measurement
Mathematical Pedagogy
Standards for Mathematical Practice

Learning Outcomes:

- Describe the essential features of a ratio, including how it relates to fractions, and articulate ways to help students understand and be able to use ratios.
- Contrast proportional and nonproportional situations using additive and multiplicative examples.
- Illustrate the different ways to solve proportional problems and describe a developmental progression for these ways.
- Compare traditional methods of teaching proportional reasoning to research-based methods.

Possible Activities:

- Mixtures: The Same or Different?
- Which Has More?
- Different Objects, Same Ratios
- Look Alike Rectangles
- Scale Drawings
- Using Strip Diagrams to Solve Proportion Problems

Assignments:

1. Quiz/Reflection Chapter 17

2. Seda & Brown, Chapter 6
3. Zager, Chapter 11
4. Padlet #5

Module 5: Developing Concepts of Data and Statistics

Strands
Measurement and Data
Mathematical Pedagogy
Standards for Mathematical Practice

Learning Outcomes:
- Explain differences between statistics and mathematics, including what is meant by "doing statistics."
- Describe techniques for collecting data, including sampling, as well as quality sources for finding data.
- Determine developmentally appropriate ways for students to analyze data, including ways to help students determine which options best represent their data.
- Illustrate and explain the meaning of measures of center and measures of variability.
- Organize categorical and numerical measurement data and represent data in picture graphs, bar graphs, and dot plots (line plots).
- Ask and answer questions that help students focus on interpreting data.

Possible Activities:
- Statistical Questions Versus Other Questions
- Critique Data Displays or Their Interpretations
- Critique Reasoning About Mean and Median
- Comparing Paper Airplanes
- Standing on One Foot
- Mystery Data

Assignments:
1. Quiz/Reflection Chapter 20
2. Seda & Brown, Chapter 7 and Conclusion
3. Zager, Chapters 12,13
4. Padlet #6

Module 6: Exploring Concepts of Probability

Strands
Data Analysis and Probability
Mathematical Pedagogy
Standards for Mathematical Practice

Learning Outcomes:
- Describe the probability continuum, including examples from impossible to certain.
- Contrast theoretical probability and experiments including how to integrate both into instruction to better develop a strong understanding of probability.
- Illustrate and explain strategies for determining sample space for compound events in a developmental manner.

Possible Activities:
- Probability with Spinners
- Flipping Coins
- How Many Keys Are There?

- Number Cube Rolling Game
- Picking Marbles from a Bag

Assignments:

1. Quiz/Reflection Chapter 21
2. Padlet #7

Week 14 Final Presentations