

George Mason University
College of Education and Human Development
Early Childhood Education for Diverse Learners

ECED 515.001 Mathematics for Diverse Young Learners
3 Credits, Fall 2024, In-person
8/26/2024-12/18/2024; Thursdays/ 4:30 pm-7:20 pm
Peterson 2413, Fairfax Campus

Faculty

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Prerequisites

ECED 401 or 501 and ECED 403 or 503

Prerequisites require a minimum grade of C for undergraduate courses and B- for graduate courses.

University Catalog Course Description

Examines ways to foster development of mathematics in preschool to third-grade children. Covers construction of mathematics lessons and hands-on experiences that promote learning in children with diverse abilities and cultural and linguistic backgrounds.

Course Overview

This class is identified as a *Students as Scholars* Scholarly Inquiry course, where students learn about the recursive process of scholarly inquiry through studying previous scholarship and applying it to teaching and learning. In this course, students will analyze and evaluate quantitative and qualitative research focused on a specific question related to providing instruction that enhances young learners' mathematical understandings. Students will do the following:

- Articulate a question, problem, or challenge that is generally relevant and appropriate in scope (e.g., Why is teaching patterning important? What are effective approaches to teaching patterning to diverse prekindergartners?).
- Identify ethical issues related to using existing research to inform mathematics instruction and ethical considerations when working with young children.
- Communicate knowledge about evidence-based practices gathered from peer-reviewed research articles by writing a research brief to share with classmates.

Course Delivery Method

This course will be delivered using a lecture format.

Learner Outcomes or Objectives

This course is designed to enable students to do the following:

1. Explain how previous mathematics content coursework has developed understandings of mathematics content identified in *Virginia's Early Learning and Development Standards* and the *Virginia Mathematics Standards of Learning* and explain how these standards provide a sound foundation for teaching mathematics in prekindergarten through third grade.
2. Discuss the contributions of different cultures toward the development of mathematics and the role of mathematics in culture and society.
3. Describe the role of family and community knowledge, experience, and resources in planning and implementing mathematics content in the curriculum.
4. Explain the sequential nature and vertical progression of mathematics and the multiple representations of mathematical concepts and procedures.
5. Use the five processes: reasoning mathematically, solving problems, communicating mathematics effectively, making mathematical connections, and using mathematical models and representations at different levels of complexity.
6. Plan instruction guided by the *Virginia's Early Learning and Development Standards*, the *Virginia Standards of Learning for Mathematics*, and the standards identified by the National Council of Teachers of Mathematics in the following content areas: (a) number systems, their structure, basic operations, and properties; (b) elementary number theory, ratio, proportion, and percent; (c) algebra; (d) geometry; and (e) probability and statistics.
7. Evaluate, select, and adapt a variety of instructional materials, manipulatives, technologies, and teaching strategies to engage diverse young learners in mathematics.
8. Describe strategies to help young children become mathematically literate, think critically and creatively, and to see the relationships between mathematics and other content areas.
9. Construct mathematics experiences in an environment that promotes equity and responds to cultural, linguistic, and ability diversity.
10. Describe the appropriate use of calculators and technology in the teaching and learning of mathematics, including virtual manipulatives.
11. Develop informal assessment strategies to describe young children's understanding of mathematics concepts.
12. Analyze and evaluate qualitative and quantitative research literature to determine effective evidence-based practices for diverse young learners and inform instruction and use technology for learning, research, and communication.
13. Engage in reflection, collaboration, and continuous learning to develop professionally.
14. Exhibit standards of professionalism, ethical standards, and personal integrity with children, families, and professionals in the field and in interactions with classmates, the instructor, the field experience coordinator, and others.
15. Use writing as an instructional and assessment tool to generate, gather, plan, organize, and to communicate for a variety of purposes; integrate correct written conventions (i.e., grammar, usage, mechanics, and spelling); and format using current APA style.

Professional Standards

Interstate Teacher Assessment and Support Consortium (InTASC) Teaching Standards, Division of Early Childhood (DEC) Initial Practice-Based Professional Preparation Standards for Early Interventionists/Early Childhood Special Educators (EI/ECSE), National Association for the Education of Young Children (NAEYC) Professional Standards and Competencies for Early Childhood Educators, Virginia Professional Studies Endorsement Competencies, and Virginia Early/Primary Education PreK-3 Endorsement Competencies

Upon completion of this course, students will have met the following professional standards:

Virginia Early/Primary Education PreK-3 Endorsement Competencies

Methods

Knowledge and Skills: Mathematics

Required Texts

American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th ed.). Author. ISBN: 9781433832161

Copley, J. V. (2010). *The young child and mathematics* (2nd ed.). National Association for the Education of Young Children. ISBN: 9781928896685 (**PDF ON BLACKBOARD, DO NOT BUY**)

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Author. <http://www.nctm.org/standards/content.aspx?id=16909>

National Council of Teachers of Mathematics. (2006). *Curriculum focal points for prekindergarten through grade 8 mathematics*. Author. <http://www.nctm.org/standards/content.aspx?id=270>

Parks, A. N. (2005). *Exploring mathematics through play in the early childhood classroom*. Teachers College Press. ISBN: 978-0-8077-5589-1

Van de Walle, J., Lovin, L. A., Karp, K., & Bay-Williams, J. (2018). *Teaching student-centered mathematics: Developmentally appropriate instruction for grades pre-k-2* (2nd ed.). Pearson. ISBN: 9780134556437

Virginia Department of Education. (2016). Mathematics standards of learning. https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/index.shtml

Virginia Department of Education. (2016). Mathematics curriculum framework. https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/

Access Blackboard for additional class readings.

Additional Readings:

Boaler, J. & Dweck, C. (2015). *Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching*. Jossey-Bass. ISBN: 0470894520

Bresser, R., Melanese, K. & Sphar, C. (2008). *Supporting English Language Learners in Math Class, Grades K-2. Math Solutions*. ISBN: 0941355845

Byrd, K. O., Cooper, K., Bolger, R. & Treece, H. (2023). Chalk Talk: Engaging All Students in Visible Thinking. *Mathematics Teacher: Learning and Teaching PK-12*, 116(3), 202-205. DOI: <https://doi.org/10.5951/MTLT.2022.0292>

Donohue, C. (2017). Putting the "T" in STEM for the Youngest Learners: How Caregivers Can Support Parents in the Digital Age. *Zero to three*, 37(5), 45-52.

Economopoulos, K. (1998). What Comes Next? The Mathematics of Pattern in Kindergarten (Early Childhood Corner Volume 5, Issue 4). The National Council of Teachers of Mathematics, Inc. <https://pubs.nctm.org/view/journals/tcm/5/4/article-p230.xml>

Green, E. (2014, July 23). Why do Americans stink at math? *The New York Times Magazine*. <https://www.nytimes.com/2014/07/27/magazine/why-do-americans-stink-at-math.html>

Guarino, J. & Manseau, S. (2023). *Identity making in kindergarten: Diego's story*. The National Council of Teachers of Mathematics, Inc.
https://education.uci.edu/uploads/7/2/7/6/72769947/mtlt-article-p419diego_article__1_.pdf

Hansel, R.R. (2017). Blocks: Back in the Spotlight Again! Community play things.
<https://www.communityplaythings.com/resources/articles/blocks-back-in-the-spotlight>

Harris, Mauree E.(2009). "Implementing Portfolio Assessment". *Young Children*, 64, 82- 85.
 ISSN: 00440782

Kamii, C. (2006). Measurement of length: How can we teach it better. The National Council of Teachers of Mathematics, Inc.
http://courses.edtechleaders.org/documents/midmeasure/Msmnt_of_Length.pdf

Kelemanik, G., Lucenta, A. & Creighton, J. (2016). *Routines for reasoning: Fostering the mathematical practices in all students*. Heinemann. ISBN: 0325078157

McCormick, K. K. (2015). Making Fractions Meaningful. *Teaching Children Mathematics*, 22(4), 230-238. <https://doi.org/10.5951/teachmath.22.4.0230>

Mokros, J. & Wright, T. (2009). Zoos, Aquariums, and Expanding Students' Data Literacy. *Teaching Children Mathematics* 15(9),524-530. DOI:10.5951/TCM.15.9.0524

Novakowski, J. (2007). Developing "Five-ness" in Kindergarten. *Teaching Children Mathematics*.
https://s3.amazonaws.com/scschoolfiles/725/kinder_developing_fiveness.pdf

SanGiovanni, J. J., Katt, S. & Dykema, K. J. (2020). *Productive math struggle: A 6-Point action plan for fostering perseverance*. Corwin. ISBN: 1544369468

Wiest, L. R. (2002). Multicultural mathematics instruction: Approaches and resources. *Teaching Children Mathematics* 9(1), 49-55. DOI:10.5951/TCM.9.1.0049

Taylor-Cox, J. (2003). ALGEBRA in the Early Years? Yes! Teaching and Learning about MATH.
http://resourcebinderecse.weebly.com/uploads/2/0/1/3/20133951/algebra_in_the_ec_years.pdf

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard, VIA, hard copy).

Assignments	Due Dates	Points
Attendance and Participation <ul style="list-style-type: none"> • Self-Evaluation 	Ongoing December 12	25
Personal Journal <ul style="list-style-type: none"> • Part 1 • Part 2 	September 5 December 12	10 5 5
Mathematics Activity Share	Variable	15
Teaching Math Through Picture Books Poster and Presentation	October 10	10
Research Brief and Presentation: An Inquiry Into Evidence-Based Practices <ul style="list-style-type: none"> • Brief • Presentation 	October 17	15 12 3

Assignments	Due Dates	Points
Family Math Night Lesson Implementation and Reflection		25
<ul style="list-style-type: none"> • Part 1: Planning the Lesson • Part 2: Collecting Data • Part 3: Reflecting on the Lesson 	November 7 November 7 November 21	10 5 10
TOTAL		100

- **Assignments and/or Examinations**

Personal Journal (Part 1=5 points; Part 2=5 points)

- **Part 1:** To initiate class experiences, students will write a critical reflection on their personal experiences as a learner of math (2 pages). They will use the following prompts to help guide their reflection process.
 - Begin with your earliest memories (give examples) and reflect until the present as an undergraduate student in a teacher preparation program.
 - Reflect on your experiences in school, out of school, in the context of your family, etc.
 - What thoughts do you tell yourself about math (e.g., ANTs = automatic negative thoughts/assumptions/not truths)?
 - How do you see yourself as a math learner?
 - Why do you think you feel that way?
 - How do you think these experiences will shape you as a teacher of math? In other words, what positive impacts or challenges on your teaching practice do you foresee from your prior experiences or self-conception?

- **Part 2:** In conclusion of the course, students will revisit their initial thoughts in their first journal entry and reflect on how their thoughts and/or self-conception have changed, if at all (2 pages). They will use the following prompts to help guide their reflection process.
 - What thoughts do you tell yourself about math (e.g., ANTs)? Have your thoughts changed? Your self-conception related to math?
 - If you did in the first place, do you still have ANTs?
 - What do you do if you have an ANT?
 - How does this change, if at all, how you will work with your future students?
 - How did learning about cognitive behavioral therapy (CBT) and transactional analysis (TA) impact your feelings about the course and math? Was it helpful?
 - Do you view yourself as a math learner differently than you did before?
 - What have you learned in the course?
 - Is there a concept you learned in the course that really stuck out for you? (Include references to course readings, as necessary.)
 - Is there a particular reading, handout, or material from class that you found particularly helpful or eye-opening? (Include references to course readings, as necessary.)
 - Articulate the kind of early childhood mathematics teacher you plan to be. Will something you learned in the course be included in your guiding principles?

Mathematics Activity Share (15 points)

Students will choose a mathematics content area from one of the following: (a) number systems, their structure, basic operations, and properties; (b) elementary number theory, ratio, proportion, and percent; (c) algebra; (d) geometry; and (e) probability and statistics during the first class session in which to present an activity. Three students will sign up per content area: one person will focus on PreK, one on K-Grade 1, and one on Grades 2-3. **Check sign-up sheet to avoid duplication of activities.** Individual students will prepare a lesson plan using the template provided for the activity they will present. Math activity share should be 15-minutes in duration.

Before the mathematics activity share, students will post all share materials (lesson plan, resources) on Blackboard under Discussion Board. Students should prepare seven PPT slides to organize and guide the presentation:

1. Introduction/Overview of Topic
2. Standards
3. Instructions for Activity/List of Materials
4. Classroom Management Recommendations, Differentiation Strategies for a Range of Learners
5. Direct Instruction of Math Concept
6. Takeaways from Practitioner Journal Article (from e.g., NCTM's *Teaching Children Mathematics*)
7. Additional Resources (picture books, websites, manipulatives, games, etc.).

Additionally, the required components of the Activity Share must include:

- An overview of the topic to include the key ideas or content and the importance of the topic to children's mathematics learning;
- An overview of relevant state and national content standards at the appropriate grade level(s), noting consistencies (or inconsistencies, if the case may be);
- Materials appropriate to the activity (use own or borrow from the instructor; attempt to use items that can be found easily around the home; materials should be visually attractive and enticing for young learners);
- A description of classroom and behavior management strategies that would increase the effectiveness of the implementation of the activity;
- Preparation for how to adapt the activity for a range of learners;
- Modeling of the math concept (model yourself, please do not use a video to do the teaching for you); it should be evident that the student has read the course material on the mathematics topic;
- Modeling how to engage in the activity chosen for math concept; math activity should be in-line with the type of math teaching practices we are learning about in the course (e.g., hands-on with materials, NOT a worksheet);
- Modeling of the math concept and activity should be role-played as if student is the teacher and classmates are young learners in the class; and
- A list of at least three resources related to teaching the topic that could include children's literature, practitioner articles, websites, games, manipulatives (concrete or virtual), songs, or other teacher resources (at least one must be a relevant developmentally

appropriate picture book and one must be an article from a practitioner journal (e.g., NCTM's *Teaching Children Mathematics*) on the topic).

Teaching Math Through Pictures Books Poster, Presentation, and Rationale (10 points)

To engage in the core math content areas of (a) number systems, their structure, basic operations, and properties; (b) elementary number theory, ratio, proportion, and percent; (c) algebra; (d) geometry; and (e) probability and statistics in an appropriate interdisciplinary and social-justice-related context, students will choose a picture book focused on the topic immigration and/or migration and can be used to teach a math concept. They will make either a hard copy or an electronic poster that includes the following information: title, author, possible math concepts that can be taught using the text, appropriate age/grade level, relevant standards, a meaningful quote from the picture book, instructions and diagram(s) for a relevant interactive activity for children, and a rationale (no more than one double-spaced page) for decisions made, including citations of at least two course readings. Students should have materials for the activity available to show classmates during presentation. Students will present their posters to classmates during an in-class poster session. Students will upload an electronic copy of the poster to Blackboard in addition to their rationale.

Research Brief: An Inquiry into Evidence-Based Practices (15 points)

In two-person partnerships, students will identify a question of interest related to the teaching of mathematical concepts to diverse young learners. Each student will conduct a literature search to identify four research articles (eight total per pair) related to the question published in peer-reviewed journals. Each student will read the articles identified in the literature search.

Student partners will prepare a two-page, single-spaced research brief, including the reference list, that presents the findings of four of the research studies read and analyzed (each student will choose two of the articles for which to write summaries). Students will follow APA style and will include the following:

- An introduction that presents the question, describes the mathematical concept that is the focus of the inquiry, and provides an overview of the research
- A paragraph summary for two research articles, including (a) a brief description of the participants, (b) a brief summary of the methods, and (c) an overview of the findings (Each student will be responsible for drafting two of the summary paragraphs. They will be responsible for reviewing and providing feedback on their partner's two summary paragraphs.)
- A conclusion that summarizes what the research says about teaching the selected mathematical concept to diverse young children
- Citations within the brief to support the evidence presented
- A bibliography, including the four articles summarized plus the additional four articles read

As part of the inquiry process, students will use the research synthesis to inform their *mathematics implementation lesson and reflection* assignment.

Partners will present their research brief in class. Students will prepare a PowerPoint presentation to share their inquiry into evidence-based practice. Students will summarize what the research says about teaching the selected mathematical concept to diverse young children. Slides will

include (a) title slide, (b) introduction to line of inquiry, (c) key points of what the research says and implications for practice, and (d) references.

Family Math Night Lesson Implementation and Reflection (25 points)

In the same two-person Research Brief partnerships, students will use what they learned during their inquiry into evidence-based practices to choose a developmentally appropriate math lesson for young learners in one of the core math content areas as defined by *Virginia's Early Learning and Development Standards*, the *Virginia Math Standards of Learning*, and the *National Council of Teachers of Mathematics Standards* from either the course textbooks, Virginia Department of Education, NCTM Math Innovations, or resources shared in class. Students will evaluate the lesson in light of what the research suggests and decide what, if any, adaptations need to be made to the lesson plan.

They will implement the lesson during a Family Math Night at either the Mason Child Development Center or the Main Street Child Development Center (CDC) during our regular class time to multiple groups of preschool-aged children, making necessary modifications, taking reflective notes, and completing an assessment tool (*date TBD*). Students will bring ALL necessary materials for the lesson. One partner will lead the lesson while the other partner takes anecdotal notes during the iterations and then the partners will switch roles. The student teaching will complete the teacher's checklist for assessment purposes that she/he created for the lesson while teaching. Students will submit a written reflection individually in three parts. *If a student is absent on the day of implementation, he/she will need to make arrangements with the CDC to visit during his/her own time to fulfill the assignment.*

- **Planning the Lesson (10 points).** The first part of the reflection will be due before the experience and will include how the lesson was selected; how course readings support the selection of the lesson plan; what adaptations were made, if any, to the lesson plan and why; and how the students prepared to implement the lesson. Students will include plans for classroom and behavior management, building community, and creating and maintaining a safe environment. In addition, they will create a one-page handout to give to family members at the Family Math Night that includes 1) A summary of the math topic, 2) Relevant pre-K standards, and 3) An activity that students and family members can do at home to practice the math concept. For this part, students will be assessed on their discussion of preparation and selection of all of the necessary materials (materials should be visually attractive and enticing for young learners) for the lesson, including being prepared to implement the lesson upon arrival at the CDC and the home-school connections handout. Partners will write and submit this reflection individually. (2 to 3 double-spaced pages)
- **Collecting Data (5 points).** The second part of the reflection will be due before the experience and will include (a) a statement about their ethical considerations as they planned for the data collection and (b) a plan for collecting quantitative and qualitative data. Partners will develop an observational tool (a teacher's checklist) to use to collect data about the children's participation in the lesson (must be submitted). They also will identify work samples (may be photos) they will collect and how they will be assessed using a rubric (must be submitted) and analyzed to determine children's learning of the concept. Partners will

write and submit this reflection individually, but are encouraged to collaborate and provide feedback for one another.

- ***Reflecting on the Lesson (10 points)***. The third part will be due after the experience and will include an analysis of the qualitative and quantitative data collected (inclusion of the completed observational tool used while teaching the lesson is *required* and photos from the lesson are encouraged, as well as a reflection on how the lesson went (what went well, what could have been done differently/better for next time), key learnings, and “aha” moments. Students will use the analyzed data and their own observations to reflect on both teacher learning (themselves) and children’s learning during the lesson. Students also will reflect on their classroom and behavior management and how they fostered a sense of community and “welcomeness.” Students will provide specific linkages to course readings and research articles examined for the inquiry into evidence-based practices. They will conclude the reflection by posing a compelling question about next steps for further supporting children’s understanding of the taught math concept. Partners will engage in reflective discussions about their analysis of the data and the implementation of the lesson, but will submit written reflections independently. (3 double-spaced pages)

- **Other Requirements**

Attendance and Participation (25 points)

1. Attendance is taken when the class is scheduled to start, and a student will be considered late once attendance is taken. If a student leaves more than 10 minutes before the end of the class, then it is considered an early departure. Two late arrivals or early departures, or a combination of both, equals one absence.
2. Students who are registered for the course at the start of the semester must attend the first class session to continue in the course. If the student is registered for the course and unable to attend the first class session, they should drop the course and plan to take it in a subsequent semester.
3. Course length:
 - a. For undergraduate students: In 15-week semester-long courses, more than 2 class absences will result in one full letter grade (10%) deduction. For example, if a student has a 92% in a 15-week course, after more than 2 absences their grade will automatically change to an 82%. In a course that is less than a full 15-week semester length, inclusive of 7.5-week and 10-week courses, more than 1 class absence will result in one full letter grade (10%) deduction. For example, if a student has a 92% in a 7.5-week course or a 10-week course, after more than 1 absence their grade will automatically change to an 82%.
 - b. For graduate students: In 15-week semester-long courses, more than 2 class absences will result in one letter grade (5%) deduction. For example, if a student has 92% in a 15-week course, after more than 2 absences their grade will automatically change to an 87%. In a course that is less than a full 15-week semester length, inclusive of 7.5-week and 10-week courses, more than 1 class absence will result in one letter grade deduction. For example, if a student has a 92% in a 7.5-week course or a 10-week course, after more than 1 absence their grade will automatically change to an 82%.

4. Per the catalog ([AP.1.6.1](#)), excused absences, to observe religious holidays or to participate in university-sponsored activities (e.g., intercollegiate athletics, forensics team, dance company, etc.) must be communicated to each faculty, within the first two weeks of the semester, with the dates of major religious holidays on which the student will be absent, and the dates for which they are requesting an excused absence for participation in any university-sponsored activity scheduled prior to the start of the semester, and as soon as possible otherwise. Absence from classes or exams for these reasons does not relieve students from responsibility for any part of the course work required during the absence. Students who miss classes, exams, or other assignments because of their religious observance or for participation in a university activity will be provided a reasonable alternative opportunity, consistent with class attendance policies stated in the syllabus, to make up the missed work. Students are obligated to provide their instructor with a letter from a university official stating the dates and times that participation in the University-sponsored activity would result in the student missing class.
5. Inclusive ECE program participation policy:
 - a. In accordance with the GMU Attendance Policies (University Catalog, 2023-2024), “Students are expected to attend the class periods of the courses for which they are registered. In-class participation is important not only to the individual student, but also to the class as a whole. Because class participation is a factor in grading, instructors may use absence, tardiness, early departure, or failure to engage in online classes as de facto evidence of nonparticipation.” See <https://catalog.gmu.edu/policies/academic/registration-attendance/#ap-1-6>.

Online participation in synchronous sessions requires students to remain engaged and active learners. Therefore, students must keep their camera on throughout the entire class session. Students must attend the entire class session without distractions and participate in small group and whole group activities. If cameras are off and engagement is not evidenced the student will be marked as absent.

If you must be absent, late, or leave early from class, or have your camera off, inform the instructor prior to the beginning of the class session, at least 24-48 hours.

Missed Class Reflection: *In the case of an absence, students will review the class presentation and submit a 2-3-page written reflection of the content covered (e.g., class presentation, course readings due for class, student activity share presentations, content on Blackboard) of any missed class. Reflection is due within 1 week after an absence.*

Written Assignments

All formal written assignments will be evaluated for content and presentation. The American Psychological Association, Seventh Edition (APA) style will be followed for all written work. All written work unless otherwise noted must be completed on a word processor and should be proofread carefully (use spell check). If students are not confident of their own ability to catch errors, they should have another person proofread their work. When in doubt, they should check the APA manual. Students may consult the Writing Center for additional writing support.

Students will do the following:

1. Present ideas in a clear, concise, and organized manner. (Avoid wordiness and redundancy.)
2. Develop points coherently, definitively, and thoroughly.
3. Refer to appropriate authorities, studies, and examples to document where appropriate. (Avoid meaningless generalizations, unwarranted assumptions, and unsupported opinions.)
4. Use correct capitalization, punctuation, spelling, and grammar.
5. Type the paper with double spacing (unless otherwise directed for a specific assignment), indented paragraphs, 1-inch margins all around, and 12-point Times New Roman font.

- **Grading**

A = 95-100 A- = 90-94 B+ = 87-89 B = 80-86 C = 70-79 F = <70

Incomplete (IN): This grade may be given to students who are passing a course but who may be unable to complete scheduled coursework for a cause beyond reasonable control.

All CEHD students are held to the university grading policies as described in the Academic Policies section of the current catalog, which can be accessed at <http://catalog.gmu.edu>. Those students seeking Virginia initial teaching licensure must earn a C or better in all undergraduate licensure coursework.

Use of Generative AI

Use of Generative-AI tools should be used following the fundamental principles of the Honor Code. This includes being honest about the use of these tools for submitted work and including citations when using the work of others, whether individual people or Generative-AI tools.

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times. See <https://cehd.gmu.edu/students/policies-procedures/>.

Class Schedule

Date	Topics	Readings & Assignments
<p>Week 1 Aug 29</p>	<p>Cognitive Aspects of Math</p> <p>Meaningful Math</p> <p>Being a Reflective, Collaborative Teacher of Mathematics Committed to Continuous Learning</p> <p>Introducing the Core Math Content Areas</p> <ul style="list-style-type: none"> • Number systems, their structure, basic operations, and properties • Elementary number theory, ratio, proportion, and percent • Algebra • Geometry <p>Probability and statistics</p>	<p>Parks, Chapter 1</p> <p>Van de Walle et al., Chapter 1</p> <p>Copley, Chapter 1</p>
<p>Week 2 Sept 5</p>	<p>Relevant Learning Theories/Theorists</p> <p>Constructivist Environments to Support Mathematics Learning</p> <p>Reflecting on Past and Current Experiences With Mathematics and the Implications for Teaching</p>	<p>Copley, Chapter 2</p> <p><i>Productive Math Struggle</i>, Chapter 1, 2 & 3 (on Blackboard)</p> <p><u>Reading on Blackboard:</u> <i>Why Do Americans Stink at Math?</i></p> <p>Due to Bb September 5: Personal Journal Part 1</p>
<p>Week 3 Sept 12</p>	<p>Inquiry into Evidenced-Based Practices for Teaching the Core Math Content Areas</p> <p>Mason Library and conducting literature searches and ethical considerations for selecting and using research findings</p>	<p>Van de Walle et al., Chapter 2</p> <p>Parks, Chapters 2 & 3</p> <p><u>Reading on Blackboard:</u> <i>Identity Making in Kindergarten: Diego's Story</i></p>

Date	Topics	Readings & Assignments
<p>Week 4 Sept 19</p>	<p>Mathematics Content Knowledge for Teaching and Learning</p> <p>Mathematics Content Standards as the Foundation for Teaching Mathematics: <i>Virginia's Early Learning and Development Standards, Virginia Standards of Learning for Mathematics, National Mathematics Learning Standards</i></p> <p>Formal and Informal Assessment Strategies to Describe Diverse Young Children's Understanding of Mathematics Concepts</p> <p>Analyzing and Interpreting Data to Inform Instruction and for Progress Monitoring</p>	<p>Van de Walle et al., Chapter 3</p> <p>Copley, Chapter 3</p> <p>Parks, Chapter 9</p> <p><u>Readings on Blackboard:</u> <i>Implementing Portfolio Assessment</i></p>
<p>Week 5 Sept 26</p>	<p>Mathematics Instruction and Assessment to Develop the Five Processes of Mathematical Understanding</p> <ul style="list-style-type: none"> • Reasoning mathematically, solving problems, communicating mathematics effectively, making mathematical connections, and using mathematical models and representations at different levels of complexity <p>Sequential nature and vertical progression of mathematics</p>	<p>Van de Walle et al., Chapter 4 & 5</p> <p>Parks, Chapter 7 & 8</p>
<p>Week 6 Oct 3 ASYNCHRONOUS</p>	<p>Differentiating Instruction</p> <p>Collaborating With Other Professionals</p> <p>Generating Questions to Guide Inquiry of Evidence-Based Practices</p> <p>Collaborating with Families and Communities</p> <ul style="list-style-type: none"> • Role of family and community in mathematics 	<p><i>Mathematical Mindsets</i>, Chapter 1, 2 & 3 (on Blackboard)</p> <p><i>Routines for Reasoning</i>, Chapter 2 (on Blackboard)</p> <p>Complete interactive, asynchronous presentation by October 10 (required for attendance and participation credit).</p>

Date	Topics	Readings & Assignments
	Using family and community knowledge, experience, and resources in planning and teaching mathematics	Due to Bb October 3: Teaching Math Through Picture Books Poster
Week 7 Oct 10	<p>Role of Mathematics in Culture and Society</p> <ul style="list-style-type: none"> • Cultures and the development of mathematics • Mathematics experiences to promote equity and respond to cultural, linguistic, and ability diversity <p>Reading and Analyzing Research on Evidence-Based Practices Understanding who the participants are, what methods were used, and what the results or findings mean</p> <p>Measurement</p> <ul style="list-style-type: none"> • Conservation of Number in Young Learner • Developmentally Appropriate Instruction <p>Mathematics Activity Share: Measurement</p>	<p><u>Readings on Blackboard:</u> <i>Supporting English Language Learners in Math Class</i>, Chapter 9</p> <p><i>Measurement of Length: How can We Teach It Better</i></p> <p><i>Multicultural Mathematics Instruction: Approaches and Resources</i></p> <p>Teaching Math Through Picture Books In-Class Presentation</p>

Date	Topics	Readings & Assignments
<p>Week 8 Oct 17</p>	<p>Assessment and Instruction</p> <ul style="list-style-type: none"> • Sets • Number systems and number sense • Place value • Basic operations and properties • Multiple representations of mathematical concepts and procedures <p>Instructional materials, manipulatives, technologies</p> <p>Mathematics Activity Share: Number Sense & Place Value</p>	<p>Van de Walle et al., Chapter 8 & 9</p> <p>Copley, Chapter 4</p> <p><u>Reading on Blackboard:</u> <i>Developing “Five-ness” in Kindergarten</i></p> <p>Due to Bb October 17: Research Brief & Presentation: An Inquiry into Evidence-Based Practices</p>
<p>Week 9 Oct 24</p>	<p>Assessment and Instruction</p> <ul style="list-style-type: none"> • Basic facts • Whole number place value • Whole number computation • Elementary number theory, ratio, proportion, and percent • Multiple representations of mathematical concepts and procedures • Instructional materials, manipulatives, technologies <p>Using Research to Make Instructional Decisions</p> <p>Mathematics Activity Share: Operations & Computation</p>	<p>Van de Walle et al., Chapter 10 & 11</p>
<p>Week 10 Oct 31 ASYNCHRONOUS</p>	<p>Assessment and Instruction</p> <ul style="list-style-type: none"> • Invented Strategies • Mental Math 	<p>Parks, Chapter 5</p> <p>Complete interactive, asynchronous presentation by November 7 (required for attendance and participation credit).</p>

Date	Topics	Readings & Assignments
<p>Week 11 Nov 7</p>	<p>Assessment and Instruction</p> <ul style="list-style-type: none"> • Patterns • Algebraic reasoning <p>Planning and Preparing for Instruction, Classroom Management, and Guiding Behavior</p> <ul style="list-style-type: none"> • Multiple representations of mathematical concepts and procedures • Instructional materials, manipulatives, technologies <p>Preparing to Teach Mathematical Concepts and Skills to Diverse Prekindergartners</p> <p>Mathematics Activity Share: Patterns & Algebraic Reasoning</p>	<p>Van de Walle et al., Chapter 14</p> <p>Copley, Ch. 7</p> <p><u>Readings on Blackboard:</u> <i>What Comes Next? The Mathematics of Pattern in Kindergarten</i></p> <p><i>ALGEBRA in the Early Years? Yes!</i></p> <p>Due to Bb November 7: Family Math Night Lesson Implementation and Reflection: Parts 1 and 2</p>
<p>Week 12 Nov 14</p>	<p>Assessment and Instruction</p> <ul style="list-style-type: none"> • Fractions • Multiple representations of mathematical concepts and procedures <p>Instructional materials, manipulatives, technologies</p> <p>Family Math Night at the Mason CDC (to be confirmed)</p>	<p>Van de Walle et al., Chapter 15 & 16</p> <p><u>Reading on Blackboard:</u> <i>Making Fractions Meaningful</i></p> <p><i>In lieu of meeting for class after the Family Math Night, complete interactive, asynchronous presentation by November 21 (required for attendance and participation credit).</i></p>
<p>Week 13 Nov 21</p>	<p>Assessment and Instruction</p> <ul style="list-style-type: none"> • Geometry • Spatial Reasoning <p>Assessment and Instruction</p> <ul style="list-style-type: none"> • Multiple representations of mathematical concepts and procedures • Instructional materials, manipulatives, technologies <p>Mathematics Activity Share: Fractions</p>	<p>Parks, Chapter 4</p> <p><u>Reading on Blackboard:</u> <i>Blocks: Back in the Spotlight Again</i></p> <p>Due to Bb November 21: Family Math Night Lesson Implementation and Reflection: Part 3</p>

Date	Topics	Readings & Assignments
	Mathematics Activity Share: Geometry & Spatial Reasoning	
Nov 28 THANKSGIVING – NO CLASS		
Week 14 Dec 5	<p>Assessment and Instruction</p> <ul style="list-style-type: none"> • Data analysis and statistics • Analyzing and Presenting Data • Probability and statistics • Multiple representations of mathematical concepts and procedures • Instructional materials, manipulatives, technologies <p>Appropriate Use of Calculators, Technology, and Virtual Manipulatives</p> <p>See the relationships between mathematics and other content areas</p> <p>Mathematics Activity Share: Graphing, Data Analysis & Probability</p> <p>Reflecting on the Mathematics Lesson Implementation and Implications for Filling the Role of Mathematics Teacher for Diverse Young Learners Strategies for Children</p> <ul style="list-style-type: none"> • Becoming mathematically literate • Thinking critically and creatively 	<p>Van de Walle et al., Chapters 12, 17</p> <p><u>Readings on Blackboard:</u> <i>Zoos, Aquariums, and Expanding Students’ Data Literacy</i></p> <p><i>Putting the “T” in STEM for the Youngest Learners</i></p> <p><i>Chalk Talk: Engaging All Students in Visible Thinking</i></p>
Exams Dec 11-18	Finals Exams	<p>Due to Bb December 12: Personal Journal-Part 2</p> <p>Due to Bb December 12: Attendance and Participation Self Evaluation</p>

Note: Faculty reserves the right to alter the schedule as necessary, with notification to students.

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

GMU Policies and Resources for Students

Policies

- Students must adhere to Mason’s Academic Standards (see <https://academicstandards.gmu.edu/>).
- Students must follow the university policy for Responsible Use of Computing (see <https://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.
- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <http://ds.gmu.edu/>).
- Students must follow the university policy stating that all sound emitting devices shall be silenced during class unless otherwise authorized by the instructor.
- Common Policies affecting all courses at George Mason University (see <https://stearnscenter.gmu.edu/home/gmu-common-course-policies/>).

Campus Resources

- Support for submission of assignments to VIA should be directed to viahelp@gmu.edu or <https://cehd.gmu.edu/aero/assessments>. Questions or concerns regarding use of Blackboard should be directed to <https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>.

Notice of mandatory reporting of sexual assault, sexual harassment, interpersonal violence, and stalking: As a faculty member, I am designated as a “Non-Confidential Employee” and must report all disclosures of sexual assault, sexual harassment, interpersonal violence, and stalking to Mason’s Title IX Coordinator per [University Policy 1202](#). If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as [Student Support and Advocacy Center](#) (SSAC) at 703-380-1434 or [Counseling and Psychological Services](#) (CAPS) at 703-993-2380. You may also seek assistance or support measures from Mason’s Title IX Coordinator by calling 703-993-8730 or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website: <http://cehd.gmu.edu>.