

EDUCATION 323
Techniques in Elementary School Mathematics (3 credits)
Fall 2023

Instructor: Abe Wallin, PhD

email: awallin@uwsp.edu

Office: 454 CPS

Office Hours: T,TH – 11:30 – 1:00; W – 12:00 – 1:00; or by appointment

Section 1: Tuesday & Thursday; 8:00 – 9:15 [CPS 307]

Section 2: Tuesday & Thursday; 9:30 – 10:45 [CPS 307]

Course Description: This course provides an opportunity to study the fundamental mathematical theory underlying the content contained in the Wisconsin Standards for Mathematics (K-9) utilizing a framework, based on the [Wisconsin Math Instructional Practice](#), that promotes creating a student-centered, problem-based classroom. Students will demonstrate their learning of mathematical content, structure, application, and modeling through various contexts and assignments (CAEP 2b). Topics addressed in this course include lesson and assessment design, structural analysis of mathematical models and algorithms, attending to student thinking and reason using discourse and questioning, professional noticing, inclusion strategies for students with exceptionalities, technology integration in elementary mathematics, and the effective use of manipulatives and other mathematical tools.

Instructor Note to Students: The purpose of this course is to provide you, as a student, an opportunity to solidify your understanding of mathematical concepts while supporting your transition to teaching these same topics at the elementary and middle school level. This course will use various forms of discussion to surface questions and misconceptions regarding elementary mathematics. You are highly encouraged to take ownership for your education and ask questions about all aspects of the mathematics being discussed, and the instructional implications. The instructor will do his best to create an environment where no one is embarrassed to share their thinking, much like you will do when you begin your teaching career. Your mathematics content and pedagogy questions will be valued.

Learning Outcomes:

- Become knowledgeable about instructional practices emphasizing mathematical reasoning, communication, connections, and problem-solving
- Learn the content, methods, and materials necessary to teach grades PreK-9 mathematics as recommended by the Wisconsin Standards for Mathematics
- Develop knowledge of the goals of mathematics *curriculum and instruction* for grades PreK-9 as reflected in the NCTM Standards and the Wisconsin Standards for Mathematics
- Utilize understanding of standards and learning targets to develop and/or analyze curricular resources; become a critical consumer of curriculum
- Become familiar with assessing and using children's thinking as a guide to planning instruction
- Examine personal assumptions, beliefs and values about elementary mathematics instruction
- Become more confident in one's ability to *do* mathematics and *teach* the Wisconsin Standards for Mathematic utilizing the Wisconsin Math Instruction Practices.

Available Text:

Van De Walle, J., Karp, K., and Williams, M. (2019). *Elementary and middle school mathematics: Teaching developmentally, 10th Ed.* Pearson.

Recommended Resources:

Gojak, L. & Miles, R. (2016). *The common core mathematics companion: The standards decoded, grades 3-5.* Corwin.

Gojak, L. & Miles, R. (2016). *The common core mathematics companion: The standards decoded, grades K-2.* Corwin.

Miles, R. & Williams, L. (2016). *The common core mathematics companion: The standards decoded, grades 6-8.* Corwin.

Wisconsin Educator Preparation Standards

| Category | Standard | Description |
|------------------------------------|--|---|
| The Learner and Learning | Pupil Development | The teacher understands how pupils grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas. The teacher designs and implements developmentally appropriate and challenging learning experiences for pupils. |
| | Learning Differences | The teacher uses his or her understanding of individual pupil differences and diverse cultures and communities to ensure inclusive learning environments that enable each pupil to meet high standards. |
| | 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. |
| Content | Content Knowledge | The teacher understands the central concepts, tools of inquiry, and structures of each discipline he or she teaches. The teacher creates learning experiences that make the discipline accessible and meaningful for pupils to assure mastery of the content. |
| | Application of Content | The teacher understands how to connect concepts and use differing perspectives to engage pupils in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues. |
| Instructional Practice | Assessment | The teacher understands and uses multiple methods of assessment to engage pupils in their own growth, to monitor pupil progress, and to guide the teacher's and pupil's decision making. |
| | Planning for Instruction | The teacher plans instruction that supports every pupil in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, pedagogy, pupils, and pupils' communities. |
| | Instructional Strategies | The teacher understands and uses a variety of instructional strategies to encourage pupils to develop a deep understanding of content areas and their connections, and to develop skills to apply knowledge in a meaningful way. |
| Professional Responsibility | Professional Learning and Ethical Practice | The teacher engages in ongoing professional learning. The teacher uses evidence to continuously evaluate the teacher's practice, including the effects of the teacher's choices and actions on pupils, their families, other educators, and the community. The teacher adapts the teacher's practice to meet the needs of each pupil. |
| | Leadership and Collaboration | The teacher seeks appropriate leadership roles and opportunity in order to take responsibility for pupil learning, to collaborate with pupils, their families, educators, and the community, and to advance the profession. |

* This information can be accessed at <https://dpi.wi.gov/education-workforce/prepare/educator-preparation-programs/wi-educator-preparation-standards>

CAEP Standards Addressed in EDUC 323

| # | Description |
|-----|--|
| 1.a | Candidates use their understanding of how children grow, develop and learn to plan and implement developmentally appropriate and challenging learning experiences within environments that take into account the individual strengths and needs of children. |
| 1.b | Candidates use their understanding of individual differences and diverse families, cultures, and communities to plan and implement inclusive learning experiences and environments that build on children's strengths and address their individual needs. |
| 2.b | Candidates demonstrate and apply understandings of major mathematics concepts, algorithms, procedures, applications and mathematical practices in varied contexts, and connections within and among mathematical domains. |
| 4.a | Candidates use a variety of instructional practices that support the learning of every child. |
| 4.c | Candidates explicitly teach concepts, strategies, and skills, as appropriate, to guide learners as they think about and learn academic content. |
| 4.d | Candidates provide constructive feedback to guide children's learning, increase motivation, and improve student engagement. |
| 4.e | Candidates lead whole class discussions to investigate specific content, strategies, or skills, and ensure the equitable participation of every child in the classroom. |
| 4.g | Candidates effectively organize and manage individual instruction to provide targeted, focused, intensive instruction that improves or enhances each child's learning. |

These descriptions come from the 2018 CAEP Standards.

Assignments

a) Improved Lesson Plan (30%): As an elementary math teacher, you will likely have a textbook or other curricular resource provided for you. No lesson plan is perfectly developed, so for this assignment you will be given a choice of several specific math lessons from popular, open-source texts that you will be asked to modify. You will first need to put the lesson into our course lesson plan format and then you will need to detail all the modification that you have made to the lesson based on what you have learned during the course. You will be provided detailed instructions for this assignment at the beginning of the semester [**Signature Assignment, CAEP 1.a, 1.b, 2.b, 4.a, 4.c, 4.d, 4.e, 4.g**].

b) Noticing Portfolio (25%): *Teacher Noticing of Student Thinking* is an area within the current mathematics education research. This body of research focuses on how teachers respond to student thinking in classroom situations. Studies have found that this is a skill that can be developed over time with specific experiences. For this class you will create a portfolio of your noticing over the course of the semester. This process will be facilitated through watching several short videos (less than ten minutes each) and responding to what you noticed. You will receive points by completing each of the videos and your comments will not be graded per se as you will hopefully increase your noticing ability as time progresses. You will be provided detailed instruction about this assignment towards the middle of the semester.

c) Mathematical Models and Algorithms Assignment (10%): We will be exploring numerous mathematical models and algorithms during this course. You will need to understand how to best utilize these tools in the classroom. This assignment will require you to demonstrate your understanding of the interconnections between different representations. More information will be provided in class.

d) Teacher Ethos (8%): Your ethos grade will reflect how you approach the profession of teaching and, more specifically, how you approach the teaching of mathematics. The following is a list of items that

will be considered when deciding your score in this area: 1) Student's willingness to participate, 2) Student's overall professionalism (timeliness, attendance, etc.), 3) Student's interactions with peers, 4) Student's attitude towards learning/teaching. You will have an opportunity during mid-term and the end of the semester to submit a Teacher Ethos Self Evaluation document.

e) Name Tag (2%): You will be asked to create a nametag on the first day of this class. You are asked to display this name tag each day you attend class. You will receive 2% of your grade from displaying your name tag during the semester.

f) Desmos Activities (8%): You will be asked to complete several Desmos Activities during this class. Some of these activities will be explorations and others will be assessments of your mathematics knowledge. You will be provided with clarification by your instructor and within the activity about the point structure for each of these tasks.

g) Topic Reflections and Quizzes (17%): Periodically you will be asked to complete a reflection or exit ticket during class or within Canvas. In class assignments are unscheduled and may occur at any time. It is **not** possible to make up these (in class) assignments unless an approved absence has been granted. All reflections in canvas will be due the following Tuesday by 8:00 a.m.; no make-ups will be allowed. Quizzes will be unscheduled and are not available after the class period in which they are given.

Grading Policy

An adequate performance on any task will earn approximately 75 percent of the points possible. Higher scores, less commonly awarded, reflect above average (B) and excellent (A) work. In other words, final grades of A, D, and F are uncommon; Bs and Cs are the common grades awarded. However, because the scoring is performance-based and criterion referenced (i.e., the scores are not placed on a curve), it is possible for all students to earn an A.

This course uses a weighted average to calculate the final grade. It is difficult to know how many points will be offered during this course, so using a weighted average provides flexibility for the instructor while conveying expectations for the students. This means that a letter grade will be calculated for each of the six areas (combining Ethos and Name Tags) using a simple average in each area (adding up points and dividing by the number of assignments). The following equation will be used to calculate the final grades for the course: $0.3(a) + 0.25(b) + 0.10(c) + 0.1(d + e) + 0.25(f + g) = \text{final grade}$, where each letter corresponds to the grade point (4.0, 3.67, 3.33, 3.0...) for each associated component. You can track your own grade by calculating averages and using this equation. The scores you see in canvas may not represent your actual grade due to weighting – please talk to your instructor for assistance if you need clarification.

Grade Cut-Offs for converting points to letter grades

A ($93\frac{1}{3}\%$ - 4.0); A- (90% - 3.67); B+ ($86\frac{2}{3}\%$ - 3.33); B ($83\frac{1}{3}\%$ - 3.0); B- (80% - 2.67); C+ ($76\frac{2}{3}\%$ - 2.33); C ($73\frac{1}{3}\%$ - 2.0); C- (70% - 1.67); D+ ($66\frac{2}{3}\%$ - 1.33); D (60% - 1.0); F (<60% - 0.0)

**Please note: Unexcused late work will not be accepted. For late work to be excused, students must immediately discuss reasons with the instructor, who will then make the determination. Excused late work should be submitted as soon as possible. Please do not wait and bring it to the next class meeting.

Attendance

As a pre-service teacher, you are expected to attend every class meeting. In viewing the classroom assignments section of this document, you will notice that a significant portion of your grade is directly tied to your attendance (Teacher Ethos, Topic Reflections, Name Tag). Your ability to attend class can potentially mean the difference between earning an A or a C in this class. It is difficult to grow as an educator when you do not attend class regularly.

With that said, there are sometimes circumstances outside of our control that we need to address. The more that you can communicate this information to your instructor the better. Personal illness or family crisis will be taken into consideration when determining the impact on your success in the class. Events such as wanting to take a vacation or attending a wedding are not considered reasonable excuses to miss class. Use your professional judgement to decide whether an absence is worth the consequence.

Technology Guidelines

In Class: Your active participation is essential in this class. Access to your cell phone or a personal computing device will occasionally be required during class time. All personal communications should be limited to emergency situations. Your instructor will turn off his phone ringer and limit his non-academic use of technology during class, he asks that you do the same. If your use of these technologies becomes distracting to the instructor or other students, you may be asked to leave that class.

Web-Based Assignments: At times you will be asked to engage in online assignments either inside or outside of class. Information from these tasks may be used during classroom discussions, but there will be no direct link between you and your work when used in this manner. For example, the mathematical program Desmos has an anonymizer feature that changes every student's name to a famous mathematician. Your instructor may show student thinking from a Desmos activity, but, using the anonymizer feature, no one will know the identity of the student whose work is being viewed.

Writing Style

All written materials are expected to be of professional quality. As a professional, it is important to present all work in a proficient manner. Therefore, please be sure to check all mechanics of your writing prior to turning in the assignment. It is recommended that you **ask a peer to proofread assignments** prior to submission. **Do not rely on Spell Check alone.** It cannot identify all spelling errors. Unprofessional work will receive a lower grade.

Confidentiality

As a community of learners, it is important that we maintain a trusting relationship among each other. You and your colleagues will be asked to take some risks during this class, which may expose some misunderstandings. It is vital to everyone's growth that we do not share this information outside of our classroom setting.

Inclusivity

All students deserve an opportunity to learn without the distraction of arbitrary exclusion based on gender identity, sexuality, disability, age, socioeconomics, ethnicity, race, nationality, religion, or cultural beliefs. It is the instructor's intent to provide an environment where all feel welcome to share and be heard by their peers and their professor. Please let me know ways that I might improve the classroom experience for you, other individuals, or other student groups.

If you have experienced a bias incident (an act of conduct, speech, or expression to which a bias motive is evident as a contributing factor regardless of whether the act is criminal) at UWSP, you have the right to report it using this [link](#). You may also contact the Dean of Students office directly at dos@uwsp.edu.

Face Coverings

Currently there are no university requirements for wearing a face covering during class. You are encouraged to consider wearing a facemask if you have not been vaccinated or if you are in a high-risk category. Any new university policies concerning face coverings enacted during the semester will supersede this policy. For more information on Coronavirus procedures at UWSP, please see the university's website: <https://www3.uwsp.edu/ucm/Pages/PointofU-CovidUpdate.aspx>.

Disability and Assistive Technology Center [DATC]

If you have a disability and require classroom and/or exam accommodations, please register with the Disability and Assistive Technology Center and then contact me at the beginning of the course. I am happy to help in any way I can. For more information, please visit the Disability and Assistive Technology Center located on the 6th floor of the Learning Resource Center (Library). You can also find more information here: <https://www.uwsp.edu/datc/Pages/default.aspx>. Again, any special circumstances that are unique to you as a student learner can be discussed at any time. Please make special arrangements to meet privately during my office hours.

The Bottom Line: Finally, if you have a question or concern regarding the class, projects, readings, assignments, or absences, it is up to you to ask. You are ultimately responsible for your own learning. I will make myself available for you if you need assistance, but I will not know unless you seek me out; when in doubt ask!