Fall 9-1-2022

# EDU 497.01: Methods: 5-8 Mathematics (Graduate)

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**EDU 497.01 Methods: 5-8 Mathematics**
**Fall 2022** **CRN#** 71887
**Tuesday & Thursday 12:30 –1:50 AM**
**ED 241**

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"It is the supreme art of the teacher to awaken joy in creative expression and knowledge."
*Albert Einstein*

## Land Acknowledgement

I begin this semester and this course acknowledging that the campus is on the traditional territory of the Salish and Pend d'Oreille peoples and that their Salish descendants may be in the classroom with us today. I make this acknowledgement in order to promote greater consciousness of Native sovereignty and cultural rights.

### Overview

This course provides an opportunity to build a conceptual and pedagogical framework for mathematics education, 5-8. Throughout the course, the student will get acquainted with middle school mathematics topics, methods, and materials. In addition to content, other areas to be explored include: curriculum changes, current research in mathematics education, and professional organizations, including the National Council of Teachers of Mathematics (NCTM).

### Goals of this course

1. Gain a positive perspective on mathematics; it is intrinsically rewarding to learn and to teach mathematics!
2. Learn about and how to construct problem-based, student-centered approaches to learning and avoid or work with misconceptions acquainted with various math concepts, including how to appropriately scaffold instructional methods.
3. Learn about and construct appropriate assessments for problem-based, student-centered approaches to learning.

### Student Objectives

1. Become acquainted with the MT Mathematics Standards (2011), including the IEFA component, across grades K-8, but specifically this term 5-8. Also learn appropriate methodology for different development levels. OPI Link
2. Become aware of different learning modalities, as well as consider multicultural, language and gender differences in children and adjust lessons to meet the needs of a broad range of learners.
3. Become aware of misconceptions acquainted with the learning of specific math concepts and ways to help learners overcome these.
4. Learn different ways to assess and evaluate students' progress in a mathematics curriculum and use assessment data to plan effective instruction, intervention and enrichment.

5. Become acquainted with professional organizations and various sources of research that support and influence the teaching of mathematics. (NCTM, SSMA, MCTM, MFPE)

## Teaching-Learning Strategies and Instructional Methods

This course engages learners in small and whole group work. Ongoing participation is essential to the flow of learning; your comments, readings from the text, and your analysis of the text including disagreements with the author and/or instructor are encouraged. It is through critical analysis of information that we grow and learn, rather than just collecting more data/facts to know.

The following practices will be modeled by faculty and students, and are expected practices by all members of the class:

1. reading & responding to experts in the field as well as innovative & visionary thinkers;
2. researching and writing about curriculum;
3. spirited discussion based on extensive reading and investigations outside class;
4. individual, small group, and large group interactions;
5. cooperative learning activities;
6. written responses to assignments;
7. hands-on applications of theories and other information to specific curricula materials;
8. inquiry and other teaching techniques that promote thinking and learning.

## Statement on Diversity, Equity, and Inclusion

It is my hope that all students with their diverse backgrounds and perspectives will experience success in this course and that all students' learning needs will be addressed. I understand the variety of perspectives and life experiences that students bring to my class as important resources and assets from which everyone in our learning community will benefit. I also hope that the course I designed is reflective of my commitment to diversity, equity, and inclusion in education--in terms of the courses I teach, your current and future teaching contexts, and the broader education field. Dimensions of diversity include national origin, sex, race, faith or non-faith, gender identity and expression, sexual orientation, language, disability, age, military experience, socioeconomic status, culture, political ideology, family status, and other important identity markers. The individual intersection of these experiences and identities must be recognized and valued in our course community.

Importantly, just as I hope you learn from me, I hope that you learn from your peers, too. I know that I look forward to learning with and alongside each of you. All classrooms provide a space where our unique stories can be told—but also heard. Mathematics classrooms are included. Every person and voice matters. Your suggestions about how to improve the value of diversity, equity, and inclusion in this course are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students. Please also know that I welcome communication from you at any point.

## Required Course Materials

1. Montana Office of Public Instruction (2011). *Montana's common core standards for mathematics*. Available on Moodle.
2. Van de Walle, J.A., Lovin, L.H., Karp, K.H. & Bay Williams, J.M. (2018). *Teaching Student Centered mathematics: Grades 3-5 3rd Ed.* Boston, MA: Pearson.

3. Van de Walle, J.A., Lovin, L.H., Karp, K.H. & Bay Williams, J.M. (2018). *Teaching Student Centered mathematics: Grades 6-8 3rd Ed.* Boston, MA: Pearson.
4. NCTM Membership (student e-membership $49*) Strongly recommended.*

## INTASC Standards: Professional and Pedagogical Development

### Standard #1: Learner Development

The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.

### Standard #2: Learning Differences

The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.

### Standard #3: Learning Environments

The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

### Standard #4: Content Knowledge

The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

### Standard #5: Application of Content

The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

### Standard #6: Assessment

The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

### Standard #7: Planning for Instruction

The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

### Standard #8: Instructional Strategies

The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

### Standard #9: Professional Learning and Ethical Practice

The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

### Standard #10: Leadership and Collaboration

The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

## Assessments / Assignments

Late assignments? No assignments will be accepted late unless prior arrangements have been made. Any changes to improve your score must be done within 24 hours of the posted time on your initial score. Please include your name in the file name of each assignment.

## Attendance and Participation (20%)

Attendance and participation is very important on a daily basis. Many pertinent ideas are discussed and covered only in class. Being present and *actively participating* are aspects of your grade and, as such, you will receive 20 points for attending class and actively participating. Missing class will result in a deduction of 2 points and arriving late to class/leaving class early will result in a deduction of 1 point for each incident. Teacher candidates missing more than three class sessions during the ten-week session do not qualify for placement in the field component of this course. Teacher candidates with a grade less than a C at the end of the ten-week session do not qualify for placement in the field component of this course. There are weekly assignments, some in class, some you will post in Discussion Forums. These are all part of your Participation grade.

## Peer Teaching in the Classroom (15%)

You will have an opportunity to develop and/or critique two separate lessons. First you and a classmate will develop a lesson plan using children's literature book centered around a math concept. Secondly, individually you will teach with and for your peers. Through these lessons you will critique and design lesson plans, reflect on instructor and peer feedback, to assist you in the targeted instruction. You will gain more perspective and ideas if you meet with me to discuss each of your lessons before you complete them. When your second lesson, part of your CAP, is taught, your individual plan and reflection are due within one week of teaching to your peers. (INTASC Standard #2, #3, #4, #5, #6, #7, #8, #9)

## Mathematics Content Knowledge (10%)

In order to teach mathematics, one must know mathematics. Throughout the semester, we will investigate mathematics, solve problems, and demonstrate expertise in 5-8 grade mathematics. (INTASC Standard #4)

## Critical Area Project (15%)

This project will allow you and your team to research, study and use the Common Core State Standards (CCSS) to develop lessons that support student learning in a selected Critical Area within a Content Domain in grades 5-8. In a group of 4, you will choose a Critical Area that progresses from one grade to the next. Your 4 lessons will follow the development (progression) of the concept. Additionally you will design a means to assess student understanding as a result of engaging in these learning experiences. The lessons should have a focus on conceptual understanding and/or application, as well as be hands-on and minds-on in order to deepen and/or extend student learning around standards from that Critical Area; they may not be worksheets nor should they focus on fact fluency or computation. You will complete a brief overview of each lesson as well as develop clear directions, strategies to accommodate different learning abilities, and materials necessary to fully implement it. Each CAP must have a solid assessment to capture student learning as a result from participating in these lessons. A template for the write-up of this project and a grading rubric will be provided in Moodle. You will teach your lesson during the week we cover the Domain of your critical area. (INTASC Standards #2, #3, #4, #5, #6, #7, #8, #9, #10)

## Teaching in the Field: Lesson Overview & Reflection (20%)

You will teach one math lesson, same concept, (over 2 days) during your time in the field, integrating manipulatives, technology, literature and/or cross-disciplinary connections. It must be a hands-on lesson that is conceptually based with high cognitive demand questions. You will complete one Lesson Overview and Reflection for this lesson using the template provided in Moodle comparing the method to our text. (INTASC Standards #2, #3, #4, #5, #6, #7, #8, #9, #10)

## Math in Community Assignment MCA (10%) (choices below)

You have the opportunity to learn how math is everywhere! this semester. There are 5 choices listed in Moodle. Please inform me of your choice by the end of Week 2. Fill in this Google Form by end of Week 2. They will be posted and shared at the end of the semester. (INTASC Standards #2, #3)

## Final Assignment (10%)

Comprehensive semester work: concentrate on the content from readings, peer teaching and learning, your field teaching, and class problem solving/discussions. I will use the Course Evaluation Rubric found in Moodle. RENAME the document, complete it, and provide evidence for each component of the rubric. Make a google folder or your means of collecting notes as we progress through the semester. The due date is scheduled during Finals Week. Post your completed WORD DOC (using your LAST NAME in the file name) with links. I want to learn what you knowledge you have gained as a professional educator. (INTASC Standards #4, #5, #6, #9)

## Grading Scale and Academic Honesty

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Code of Conduct.

The grading scale for this course is as follows:

| | | | |
|---|---|---|---|
| A | 95-100% | A- | 92-94% |
| B+ | 90-91% | B | 87-89% |
| B- | 84-86% | C+ | 81-83% |
| C | 78-80% | C- | 76-77% |
| D | 68-75% | F | <68 |

## Disability Statement

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you have a disability that adversely affects your academic performance, and you have not already registered with the Office for Disability Equity (ODE), please contact ODE in Aber Hall or 406-243-5330. I will be happy to work with you and ODE to provide an appropriate modification. For more information see https://www.umt.edu/disability/

## Graduate Students

All graduate students must complete a graduate increment for this course. The graduate increment for Level 3 will involve participation in a research seminar attended by all graduate students in this level and led on a rotating basis by participating faculty. The seminar will meet 8 times during the semester. Exact meeting dates, times, and locations are TBD. For the Graduate seminar you will be responsible for selecting a research article from approved research journals, developing discussion questions, disseminating the research article, bring questions and participate in the seminar. See Moodle for more details.

| **Week** | **Subject** |
|---|---|
| Week 3 & 4 | Math |
| Week 5 & 6 | Science |
| Week 7 & 8 | Social Studies |
| Week 9 & 10 | Language Arts |

## Classroom Environment and Norms:

In order to maintain a safe and productive learning environment, we will observe the following norms:

- Start and end on time Actively participate
- Be willing to share your thinking and ideas with others
- Be willing to push the boundaries of your comfort zone
- Minimize side conversations
- Manage your technology responsibly

## Math in Community Assignment (MCA) (Choose 1 from the 5 described below)

Post your assignment in the Discussion Forum. We will share them during the last week.

1. Video or audio tape an interview with someone from a different race, ethnicity, or cultural group from your own. Discuss what challenges and opportunities he or she faces or faced in a mathematics classroom. Submit the interview questions and a video (or audio tape). You must interview someone from outside your usual social circle- please talk to me with questions.
2. Create a multimedia presentation (e.g. powerpoint or other presentation software) of a historical figure children are unlikely to encounter in their mathematics curriculum. Include what contribution(s) this figure made to the mathematical world.
3. Explore Everyday Native website. This assignment has 2 parts. First, you will have to make an account, but no fee. Then you have FREE Resources!

A. Explore the website. There are 8 items in the "Contains section" on the main page. Choose one section (not video, that is the next part!). What area did you explore? What did you learn? How will this impact you in your teaching?

B. Choose from 8 different videos posted HERE. Listen to a video and share how hearing the story may impact how you interact with children in your classroom.

4. Read two short chapters from Part II and/or III of *Rethinking Mathematics (in* Moodle*)*. OR Read 2 chapters from Part IV of *Teaching Mathematics for Social Justice* (You can check it out from me). In a 2-3 page reflection, comment on the following:
a. The depth of mathematics involved in the lessons b. In what teaching settings might you use or not use these lessons c. Are there classrooms in which these lessons may be more or less effective? Explain.
5. Do a community walk around your school neighborhood. What authentic mathematics do you notice taking place in the community? What mathematics learning opportunities could you imagine taking place in this neighborhood? Sketch a map of the area using Google SketchUp-or other form of technology. Create a written key evidencing your journey and what contributions this might have to a mathematics classroom in the school.

## Campus Safety and Emergency Procedures

Campus safety is of the utmost importance at the University of Montana and the Phyllis J. Washington College of Education and Human Sciences. *Emergencies are rare*, but if one should arise during class, everyone will need to work together. Be aware of your surroundings and familiar with some basic safety and security concepts. Emergency procedures will be discussed during the first class of each semester or session. Above all, remember to dial 911 to report all emergencies. For more info, watch this 7 min video.

Emergency procedures are posted in every classroom. Should a building evacuation become necessary, know the evacuation route, the location of the nearest fire extinguisher and the location of the nearest area of refuge. (Areas of refuge are located at the elevator doors on the second and third floors.) Please notify your instructor at the beginning of the semester if you have special needs or will require assistance during an emergency situation. UM's emergency notification system notifies the campus community of emergencies by sending subscribers a text or email. Sign up for notifications through Cyberbear. For further information, see Emergency page HERE. Please report suspicious activity by calling 911 or (406) 243-4000. You may elect to remain anonymous when making a report. Active shooter preparedness requires that we develop a survival mindset. UM recommends the "Run, Lock, Fight" response for an active shooter incident.

RUN: -Quickly assess your situation.

- Leave your belongings behind.
- Keep your hands visible for law enforcement.

HIDE. -Hide in an area out of the shooter's view.

- Block entry to your hiding place and lock the doors.
- Silence your cell phone and/or pager.

FIGHT. -As a last resort and only when your life is in imminent danger. Attempt to incapacitate the shooter.

- Act with physical aggression and throw items at the active shooter.

Finally, stay current with campus safety information by following UM's Police Department on Twitter @UMPublicSafety.