

MSED 4310: Teaching Math in Intermediate/Middle Grades

Fall 2023

CRN: 15442

Location: Education Building Room 401

Class Time: 5:30 pm - 8:20 pm Wednesday

Instructor: Mary K. Roy, M.S. (mkroy@utep.edu)

Office Hours: For F2F Wednesdays: 4:30 pm - 5:30 pm and 8:30 pm - 9:30 pm, EDUC 401.
Other hours are available by appointment.

COURSE DESCRIPTION

This course covers the methods and resources for teaching mathematics in intermediate and middle school classrooms. Emphasis is placed on the equity principle (mathematics for all) and the development of conceptual understanding on topics such as real numbers and operations, geometry, algebra and functions, statistics and probability.

COURSE GOALS AND OBJECTIVES

People are born with a great capacity to learn. Doing mathematics can be a creative and empowering extension of our innate sense-making abilities. Unfortunately, few students experience math this way. School teaches many students that doing math is about quickly recalling facts and following a lot of detailed rules. Furthermore, students often get the message that if they do not excel at those things, they are not as smart or as valuable as those who do.

The principles listed below are well supported by decades of educational research. They will form the backbone (sometimes explicitly, sometimes tacitly) of our work together.

- All students can make sense of rich mathematical ideas if their teachers provide appropriate opportunities for them to do so.
- All students have knowledge and strengths that are relevant to mathematics learning.
- All students benefit from strong relationships and supportive communities. Being a teacher is as much about building community—for our students and ourselves—as it is about developing content knowledge.

STUDENT LEARNING OUTCOMES

At the end of this course, students will be able to:

	OUTCOMES	HOW OUTCOMES WILL BE ASSESSED
1	Understand how children learn and develop mathematical skills, procedures, and concepts; know the typical students' errors and misconceptions; and uses this	TEXES Connections TEKS Connections NCTM Standards

	knowledge to plan, organize, and implement instruction to meet curriculum goals.	
2	Build your capacity to teach mathematics in ways that leverage students' diverse strengths to explore important mathematical ideas and support all students to engage in authentic mathematical work by unpacking NCTM standards and developing the competencies to teach the TEKS.	TEExES Connections TEKS Connections NCTM Standards NCTM Standards Reflections Discussions Final Reflection
3	Learn the specific mathematical topics and mathematical processes for teaching through exploring how students learn, engaging in instructional activities, and reflecting on your learning.	TEExES Connections TEKS Connections NCTM Standards Discussions Activities Final Reflection
4	We will also connect mathematical content strands with mathematics to pedagogy, developing our capacity to enact ambitious and equitable teaching practices.	TEExES Connections TEKS Connections NCTM Standards Reflections Final Reflection
5	Explore and use technology to appropriately teach and prepare students to use mathematics according to the statewide curriculum (TEKS).	TEExES Connections TEKS Connections NCTM Standards
6	Understand and use numbers (structure, operations, and algorithms), patterns, functions, algebraic thinking, problem-solving strategies, and data analysis to teach the statewide curriculum (TEKS). Understand the relationship between the different symbolic representations.	TEExES Connections TEKS Connections NCTM Standards Final Reflection
7	Understand assessment and use a variety of formal and informal assessment techniques to guide instruction and support student progress.	TEExES Connections TEKS Connections NCTM Standards Online resources Final reflection

REFERENCES AND MATERIALS

You will need regular access to a computer, stable and consistent internet access, Blackboard, and your UTEP email account. There is no required text. Selected book chapters will be provided by the instructor as part of each week's readings, in addition to references to online articles and websites from various sources. A partial list of example references and resources is provided in Blackboard.

COURSE ASSIGNMENTS AND GRADING

The schedule of assignments and classroom discussions may change over the course of the semester. These modifications will be based on the specific needs of students in the course and will not exceed the difficulty or the due dates of the originally proposed assignment. Any changes to the syllabus will be announced in class and through Blackboard. Every student is responsible for these changes and should regularly check Blackboard for updated content, assignments, and announcements.

More information about each assignment is available on Blackboard, under the module for the week it is due. Please keep your assignments organized. It will serve to work on the final reflection/self-evaluation of your thinking as it evolves over the semester.

Your final letter grade for the course will be based on your accumulated points, as shown in the following table:

Letter Grade	A	B	C	D	F
Point total	1000-900	899-800	799-700	699-600	599-0

Point distribution for class assignments:

- 120 Points: Blackboard discussions
- 240 Points: Written Reflections
- 100 Points: Online class Activities
- 400 Points: F2F Class participation
- 140 Points: Final Reflection/ Self-evaluation

1. Blackboard discussions

For this course, students will be required to participate in weekly discussion boards. For discussion board participation, We encourage you to write 100-170 words in your post in response to the provided guiding questions. You should also reply (at least 25 words for each response) to the entries of **at least two** of your peers for each assigned discussion (unless noted otherwise). Refer to the discussion board and course content for further details on each assignment.

The deadline for postings is 11:59 pm MST every other Thursday. Replies to your peers are due by 11:59 pm MST every Saturday.

2. Written Reflection Papers

Students will be asked to synthesize what they are reading and integrate it with the classroom activities in relation to the guiding topic connected to secondary teaching and learning. Weekly reflections should be grammatically correct (check using the free version of www.grammarly.com or other tool), and written according to the following specifications: APA format (preferred), 12-point font, New Times Roman, double-spaced, (specific number of words), and saved as a .docx file. A good reference for

correctly formatting written assignments is Purdue University's OWL (On-campus Writing Lab) website at <https://owl.purdue.edu/>.

The deadline for postings is 11:59 pm MST every other Thursday. Specific instructions will be provided on Blackboard.

3. Online Activities

Students will be required to work on activities to address specific math concepts.

The deadline for postings is 11:59 pm MST Friday (on the assigned week).

4. F2F Class Participation

Students will be expected to actively participate in different activities during F2F classes.

5. Final Reflection / Self-Evaluation

Final reflection specifications: APA format (preferred), 12-point font, New Times Roman, double-spaced, 3-5 pages including **reference list** (include at least five learning resources that were part of the course resources and use in-text citations, and saved as a .docx file. The final reflection should be grammatically correct (check using the free version of www.grammarly.com or other tool).

A good reference for correctly formatting written assignments is Purdue University's OWL (On-campus Writing Lab) website at <https://owl.purdue.edu/>.

The last date for submitting your final reflection/self-evaluation 11:59 pm MST, Thursday, December 14th. Specific instructions will be provided on Blackboard.

LATE WORK AND ATTENDANCE POLICY

Late assignments will not be accepted. Exceptional circumstances should be communicated to the instructor.

This is a hybrid course, and attendance is required in both virtual and F2F sessions. Attendance is determined by class participation in each setting and completion of the following activities:

- Reading/previewing all course materials to ensure understanding of assignment requirements
- Participation in engaging discussions with your peers on the Discussion Boards and on F2F discussions.
- Completion of all Activities (written reflections, content knowledge activities, problem-solving, etc.)
- Completion all Major Assignments during F2F sessions.

A student may be dropped for lack of attendance. If you miss two weeks of class, contact your instructor immediately. If you cannot complete this course for whatever reason, please contact the instructor. If you do not, you are at risk of receiving an "F" for the course.

TECHNOLOGY REQUIREMENTS

Content is delivered via the Internet through the Blackboard Learning Management System (LMS). Ensure your UTEP email account is working and that you have access to the Web and a stable web browser. Mozilla Firefox and Google Chrome are the most supported browsers for Blackboard; other browsers may cause complications with the LMS. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have access to a computer/laptop, a webcam, and a microphone. You will need to download or update the following software: Microsoft Office and Windows Media Player. Check that your computer hardware and software are up-to-date and able to access all parts of the course.

If you encounter technical difficulties beyond your scope of troubleshooting, please contact the Help Desk, as they are explicitly trained to assist with students' technological needs. However, these are not 24h services, so please do not wait till the last moment to complete your assignments.

NETIQUETTE

During the online classroom sessions, our primary means of communication is written. The written language has many advantages: more opportunity for reasoned thought, more ability to go in-depth, and more time to think through an issue before posting a comment. However, written communication also has certain disadvantages, such as a lack of face-to-face signaling that occurs through body language, intonation, pausing, facial expressions, and gestures. As a result, please be aware of the possibility of miscommunication and compose your comments in a positive, supportive, and constructive manner and consider the following:

- Remember that your posts are public. All class participants will be reading any postings.
- Respect and courtesy must always be provided to classmates and the instructor. Make a point to be kind and respectful in your comments—even if you disagree with someone. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the ideas, not the person, and stay on-topic. Post only what anyone would comfortably state in a F2F situation.
- Blackboard is **not** a public internet venue; all postings to it should be considered **private and confidential**. Whatever is posted in these online spaces is intended for classmates and professors only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space. If students wish to do so, they have the ethical obligation first to request the permission of the writer(s).
- Submit files the right way. If you do not follow instructions, you're taking the risk that your instructor won't be able to find or open your assignment. Save yourself and your instructors a headache and read their instructions carefully before submitting.

ALTERNATIVE MEANS OF SUBMITTING WORK IN CASE OF TECHNICAL ISSUES

You should submit your work with plenty of time to spare in the event that you have a technical issue with the course website, network, and/or your computer. You should save all your work (answers to discussion points, reflections, and activities) in a separate Word document as a back-up. This way, you will have evidence that you completed the work and will not lose credit. If you are experiencing difficulties submitting your work through the course website, please contact the UTEP Help Desk. You can email us your back-up document as a last resort.

INSTRUCTIONAL PHILOSOPHY

The instructor's role in this class is as a facilitator and not as a sole knowledge provider. Participating actively in all that we do together is vital, not only for your own learning but also for the learning of others. Active participation means both *sharing* your thoughts, questions, and ideas and *listening* to those of other students. Consider their perspectives, and make connections with your own ideas and those of others in the class in order to advance the collective learning of everyone. These skills are critical not only for your work in this class but for your work as a teacher who hears and builds on students' ideas.

ACADEMIC DISHONESTY

Academic Dishonesty is an assault upon the basic integrity and meaning of a university. Cheating, plagiarism, and collusion in dishonest activities are serious acts that erode the university's educational and research roles and cheapen the learning experience not only for the perpetrators but also for the entire community. It is expected that UTEP students will understand and subscribe to the ideal of academic integrity and that they will be willing to bear individual responsibility for their work. Materials (written or otherwise) submitted to fulfill academic requirements must represent a student's own efforts. Any act of Academic Dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. If you use ideas or written text from other people, you must cite them.

ACCOMMODATIONS POLICY

It is our goal for you to be supported to flourish and grow in this course. If there are particular circumstances that may affect your course participation (e.g., linguistic background, religious practices, family situation, neurological differences, immigration status), please inform the instructor so that we may work together to develop strategies to meet both your needs and the requirements of the course. We will do everything we can to support you. For course accommodations, please contact CASS: [UTEP Center for Accommodations and Support Services](#).

STUDENT RESOURCES

UTEP provides a variety of student services and support:

- [UTEP Library](#): Access a wide range of resources, including online, full-text access to thousands of journals and eBooks, plus reference service and librarian assistance for enrolled students.
- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in-person if on campus.

- University Writing Center (UWC): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- Military Student Success Center: UTEP welcomes military-affiliated students to its degree programs. The Military Student Success Center and its dedicated staff (many of whom are veterans and students themselves) are here to help personnel in any service branch reach their educational goals.
- RefWorks: A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.
- Math Tutoring Center (MaRCS): Ask a tutor for help and explore other available math resources.

Tentative Course Schedule

DATE	TOPICS	READINGS & RESOURCES	ASSIGNMENTS DUE
Week 1 F2F 08/30	Syllabus & Course Overview Setting up Rules and Norms in the Math Classroom Math Topics: Number sense, shape, space, and measures	Introductory activity Examination of syllabus Exploration of course resources Video: The Power of Yet_Carol Dweck https://www.youtube.com/watch?v=J-swZaKN2Ic&t=318s Setting up Positive Norms in Math Class https://www.youcubed.org/wp-content/uploads/2017/09/Norms-Paper-2022.pdf	In class assignments
Week 2 Online 09/04-09/09	NCTM and TEKS standards "Good at Math"	Reading 1: Van de Walle, Chapter 1, "Teaching Mathematics in the Era of the NCTM Standards." Reading 2: Jo Boaler, Chapter 1, "The Brain and Mathematics learning." Video: How can be good at math and other surprising facts about learning/ Jo Boaler https://www.youtube.com/watch?v=3icoSeGqQtY&feature=emb_rel_end Other resources: Principles and Standards for School Mathematics Executive Summary https://www.nctm.org/uploadedFiles/Standards_and_Positions/PSSM_ExecutiveSummary.pdf Texas Essential Knowledge and Skills (Mathematics) http://www.tea.state.tx.us/teks/#grade	Readings 1 & 2 Discussion forum via Blackboard #1 Reflection #1
Week 3 F2F	What does it mean to learn mathematics?	Reading 3: Van de Walle, Chapter 2, "Exploring What it Means to Know and Do Mathematics." Reading 4: Constructivism https://www.funderstanding.com/theory/constructivism/	Readings: 3, 4, & 5 In class assignments

<p>09/13</p>	<p>Constructivist theory & Sociocultural theory</p> <p>Math topic: Number sense, patterns, generalizations, shapes, space, measures</p>	<p>Reading 5: Lev Vygotsky and Social Cognition https://www.funderstanding.com/category/theory/vygotsky-social-cognition/</p> <p>Resources: Texas Essential Knowledge and Skills (Mathematics) http://www.tea.state.tx.us/teks/#grade</p>	
<p>Week 4</p> <p>Online 09/18-09/23</p>	<p>Meanings for Operations</p> <p>Multi-step problems</p>	<p>Reading 6: Van de Walle, Chapter 9 "Developing Meaning for the Operations"</p> <p>Reading 7: Carpenter et al. (2015), Chapter 9 "Developing Classroom Practice: Posing Problems and Eliciting Thinking"</p>	<p>Readings 6 & 7</p> <p>Discussion forum via Blackboard #2</p> <p>Reflection #2</p>
<p>Week 5</p> <p>F2F 09/27</p>	<p>Whole Number Computation</p> <p>Mathematics Proficiency Multiple representations</p> <p>How do we learn?</p> <p>Math topic: Number sense, Whole numbers</p>	<p>Reading 8: Van de Walle, Chapter 12 "Developing Strategies for Whole-Number computation"</p> <p>Reading 9: Boaler et al., 2006 "Seeing as Understanding: The Importance of Visual Mathematics for our Brain and Learning" https://www.youcubed.org/wp-content/uploads/2017/04/JACmaths-seeing-article.pdf</p>	<p>Reading 8 & 9</p> <p>In class assignments</p>
<p>Week 6</p> <p>Online 10/02-10/07</p>	<p>Problem-solving</p>	<p>Reading 10: Problem Solving in Mathematics</p> <p>Reading 11: Lambdin, 2009 "Benefits of Teaching through Problem Solving"</p>	<p>Discussion forum via Blackboard #3</p> <p>Reflection #3</p>
<p>Week 7</p> <p>F2F 10/11</p>	<p>Assessment:</p> <p>a) Formal assessment Diagnostic Formative Benchmark Summative</p> <p>b) Informal assess.</p> <p>c) Self-assessment</p> <p>Math Topic: Geometry (triangles, quadrilaterals, polygons, types of angles, area, circle).</p>	<p>Reading 12: Van de Walle, Chapter 5 "Building Assessment into Instruction"</p> <p>Reading 13: Formal Vs Informal Assessments https://www.scholastic.com/teachers/articles/teaching-content/formal-vs-informal-assessments/</p> <p>Other Resources: Student Assessment https://tea.texas.gov/student-assessment STAAR Mathematics Resources https://tea.texas.gov/student-assessment/testing/taar/taar-mathematics-resources STAAR Interim assessments https://tea.texas.gov/student-assessment/testing/taar/taar-interim-assessments</p>	<p>Explore TEA and find the information and resources about assessment.</p> <p>Readings 12 and 13</p> <p>In class assignments</p>

<p>Week 8</p> <p>Online 10/16-10/21</p>	<p>Equity in the Mathematics Classroom</p>	<p>Reading 14: National Council of Supervisors of Mathematics and TODOS: Mathematics for ALL. (2016). Mathematics Education through the Lens of Social Justice: Acknowledgment, Actions, and Accountability.” Position Statement.</p> <p>Reading 15: Boaler, J., & Anderson, R. (2018). Considering the rights of learners in classrooms: The importance of mistakes and growth assessment practices. <i>Democracy and Education</i>, 26(2), 7.</p> <p>Resources: Texas Essential Knowledge and Skills (TEKS_Mathematics) http://www.tea.state.tx.us/teks/#grade</p>	<p>Discussion forum via Blackboard #4</p> <p>Reflection # 4</p>
<p>Week 9</p> <p>F2F 10/25</p>	<p>Algebraic Thinking</p> <p>Math topic: Generalizations</p>	<p>Reading 16: Van de Walle, Chapter 14, Algebraic Thinking: Generalizations, Patterns, and Functions</p> <p>Reading 17: Carraher, D. W., Martinez, M. V., & Schliemann, A. D. (2008). Early algebra and mathematical generalization. 3-7.</p>	<p>Reading 16 & 17</p> <p>In class assignments</p>
<p>Week 10</p> <p>Online 10/30-11/04</p>	<p>Using Technology to Teach Math</p>	<p>Reading 18: Van de Walle, Chapter 7, Using Technology to Teach Mathematics</p> <p>Resource: TEA_Technology Standards for Teachers Texas Essential Knowledge and Skills (TEKS_Mathematics)</p>	<p>Discussion forum via Blackboard # 5</p> <p>Reflection # 5</p> <p>Activity #1</p>
<p>Week 11</p> <p>F2F 11/08</p>	<p>Fraction Concepts & Fraction Computation</p>	<p>Reading 19: Van de Walle, Chapter 15, Developing Fraction Concepts</p> <p>Reading 20: Van de Walle, Chapter 16, Developing Strategies for Fraction Computation</p> <p>Reading 21: Riddle, M., & Rodzwell, B. (2000). Fractions: What happens between kindergarten and the army?. <i>Teaching children mathematics</i>, 7(4), 202-206.</p>	<p>Readings: 19, 20, & 21</p> <p>In class assignments</p>
<p>Week 12</p> <p>Online 11/13-11/18</p>	<p>Division of Fractions</p>	<p>Reading 22: Warrington, M. A. (1997). How children think about division with fractions. <i>Mathematics Teaching in the Middle School</i>, 2(6), 390-394.</p> <p>Reading 23: Perlwitz, M. (2004). Two students' constructed strategies to divide fractions. <i>Mathematics teaching in the middle school</i>, 10(3), 122-126.</p>	<p>Discussion forum via Blackboard # 6</p> <p>Reflection # 6</p> <p>Activity #2: Division of Fractions</p>
<p>Week 13</p> <p>F2F 11/22</p>	<p>Fraction, Decimal, and Percent Equivalency</p>	<p>Reading 24: Ok, M. W., Kim, M. K., Kang, E. Y., & Bryant, B. R. (2016). How to find good apps: An evaluation rubric for instructional apps for teaching students with learning disabilities. <i>Intervention in School and Clinic</i>, 51(4), 244-252</p>	<p>Reading 24 & 25</p> <p>In class assignments</p>

	Virtual Manipulatives	Reading 25: Moyer, P. S., Bolyard, J. J., & Spikell, M. A. (2002). What are virtual manipulatives?. <i>Teaching children mathematics</i> , 8(6), 372-377.	
Week 14 Online 11/27-12/02	Data Analysis	Reading: Van de Walle, Chapter 20 (21)	Discussion forum via Blackboard # 6 Reflection # 6 Activity #3
Week 15 F2F 12/06	Create Lesson: Statistical Thinking	Refer to Blackboard Assignment	
Week 16	Self-Evaluation		