



Instructor(s): Dr. Joohi Lee

Office Number: 322C Science Hall

Email Address: joohilee@uta.edu

Faculty Profile: <u>https://mentis.uta.edu/explore/profile/joo-lee</u>

Office Hours: By appointment

Section Information: MAED 5351-005

Time and Place of Class Meetings: Online

**Description of Course Content:** In this course students engage in activities and problem solving on concepts related to whole numbers, rational numbers and operations. Students in the course will learn to utilize research-based, problem-based teaching methods to promote K-12 student understanding. Students will experience how K-12 students learn these concepts as they themselves engage in computation and problem solving activities transferrable to classroom practice. In this course, students will engage in experiences to learn and teach their K-12 students on using numbers, number systems and their structure, operations and algorithms, quantitative reasoning, and technology.

**Student Learning Outcomes:** The general structure of this course engages students in active, inquiry-based math experiences that serve the purposes of a) reinforcing teacher knowledge and skills associated with whole numbers, rational numbers, and operations, b) learning to use research-based, proven math teaching practices according to state and national standards and c) translating math concepts into meaningful math learning experiences and readily usable curricula for K-12 students. The specific goals of this course are as follows:

- 1. Design activities that utilize state and/or national standards at varying grade levels.
- 2. Redesign existing lessons/activities across grade levels.
- 3. Create lessons/activities that allow students to become proficient in various math concepts.
- 4. Design mathematics activities and tasks that are cognitively demanding.
- 5. Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.
- 6. Review knowledge and skills associated with whole number operations using a 5-E inquiry model.

## **Course Prerequisites**

EDUC 5305 and EDUC 5394



# Available at following locations:

http://www.nctm.org/Store/Products/Number-and-Operations,-Part-1--Building-A-System-of-Tens-Casebook/

https://www.amazon.com/Building-System-Tens-Developing-Mathematical/dp/0769001696

https://www.abebooks.com/9780769001692/Building-System-Tens-Casebook-Developing-0769001696/plp

<u>Making Meaning for Operations (</u>ISBN-13: 978-0133733136 or **ISBN-13:** 978-0873539272) 2009 or 2016 edition of the text should be fine



Available at following locations:

http://www.nctm.org/Store/Products/Number-and-Operations,-Part-2--Making-Meaning-for-Operations-Casebook/

https://www.amazon.com/Building-System-Tens-Developing-Mathematical/dp/0769001696

https://www.abebooks.com/servlet/SearchResults?ds=20&kn=making+meaning+for+operation s&sts=t

## Supplemental Web Sources:

National Council of Teachers of Mathematics (2004) *Principles and Standards for School Mathematics*. Reston, VA: NCTM. http://standards.nctm.org/document/appendix/numb.htm

National Council of Teachers of Mathematics. Reston, VA: NCTM. <u>http://www.nctm.org/</u> (If you are not a member, you can join at the student rate; you can use my member number as a referral #4007154)

Teachers in Common Core States:

National Governors Association and Council of Chief State School Officers. (2011). *Common Core State Standards Initiative: Preparing America's Students for College & Career*. <u>http://www.corestandards.org/the-standards</u>

Teachers in Texas:

Texas Essential Knowledge and Skills (TEKS), Math. Texas Education Agency, 2012. Subchapter A (elementary school): <u>http://ritter.tea.state.tx.us/rules/tac/chapter111/ch111a.html</u> Subchapter B (middle school): <u>http://ritter.tea.state.tx.us/rules/tac/chapter111/ch111b.html</u> Subchapter C (high school): <u>http://ritter.tea.state.tx.us/rules/tac/chapter111/ch111c.html</u> Subchapter D (other high school mathematics courses): <u>http://ritter.tea.state.tx.us/rules/tac/chapter111/ch111d.html</u>

Teachers Outside of Texas and Outside of a Common Core State: Use your state curriculum standards for mathematics

## **Descriptions of major assignments:**

- 1. Module 1 Assignment "Collaboration on a Math Activity over a Whole Number Concept": Use the videos and/or cases from this module as examples to the topics and ways in which you can teach whole numbers and operations concepts. Use them as inspiration to select a concept on whole number operations and create/adapt an activity to teach it in your preferred grade level. Join one of the teams to bounce ideas back and forth about your activity. Especially discuss how your activity relates to NCTM, CCSS, TEKS or your state standards; how you ensure that it is inclusive for ALL students; and how it can be incorporated into a larger lesson/unit. Once you have selected a concept, develop the activity and share it with others in your group for feedback. Note: Number and Operations concepts past the primary grades goes beyond understanding whole numbers and the four basic operations. This includes fractions (and anything with rational numbers), radicals, absolute value, exponents, complex numbers and integers to name a few.
- 2. Module 2 Assignment "Collaboration on a Math Activity over a Fraction Concept": Read the options for fraction tasks (videos, cases and articles from this module). Use these options as examples to select a hands-on activity for teaching/reinforcing fractions/rational numbers in your preferred grade level. Join one of the teams to bounce ideas back and forth about your task/activity. Especially discuss how does your TASK relates to the national or state standards and how you ensure that it is inclusive for ALL students. Once you have selected a concept, develop the activity and share it – consider incorporating a social concern/issue
- 3. Module 3 Assignment "More Rules that Expire": In this module you read an article by Karp, Bush & Dougherty (2014), describing 13 "rules" students learn that eventually expire due to overgeneralizing, imprecise language and "tricks" that all could lead to misconceptions as they progress through their mathematics courses. In this assignment, you will extend that list of 13 "rules" by contributing other rules or language that have "expiration dates".
- 4. Module 4 Assignment "Original Cognitively Demanding Task": In this module you read about the research done by Smith, Stein, and colleagues regarding the selection of tasks that are cognitively demanding for students. In this assignment, you will create/modify two cognitively demanding Number and Operations tasks and provide justifications for your selection. (In the state of Texas, with the revised TEKS, teachers were encouraged to create Amplified Tasks, modifying tasks to increase the cognitive demand. Samples of such tasks are available in "Resources/Readings". They are not

necessarily focused on Number and Operations, though that is a requirement for this assignment).

5. Module 5 Assignment – "Professional Development Assignment": As you develop as a professional, you will come across interesting ideas in research, at conferences, or even in this course. If not already, in the future you will be considered a master teacher, a teacher leader, an administrator or even a teacher educator yourself. As such, it is a good practice to share these ideas with other professionals either by engaging in informal conversations about the topic or through presentations. The purpose of this assignment is for you to find articles in *peerreviewed* scholarly journals related to any topic from this course (i.e., fractions/rational expressions, place value, whole number operations, counting, etc.), reflect on the article, and then share your insights with one other practicing teacher who is not enrolled in this course and record the teacher's response. If you are not sure whether your journal is peer-reviewed, look up information about the journal online or in the front cover if you have a hard copy.

For this assignment, you will write an overview of the articles you read along with each article's APA-format reference. Also, include a summary paragraph discussing insights you have gained from these articles in relation to the particular topic you identified. For instance, what questions have been answered or what questions have emerged as a result of your reading? Finally, pose an informed question, based on your readings, to a practicing teacher (other than a classmate). Report the question you asked, **your** synopsis of the teacher's response, and your analysis of the teacher's response (insightful comments and/or analysis of the teacher's response).

#### 6. Module 6/7 Assignment:

You have learned about Lesson Cycles throughout this M.Ed. program. During this course, you learned about critical mathematics and Teaching Mathematics for Social Justice as well as selecting and maintaining the cognitive demand of a *high level* task through using a protocol called "Thinking Through a Lesson Protocol" (TTLP) presented in the Stein et al (2008) article. Using these foundations, along with your standard(s) of choice (i.e., NCTM, TEKS, CCSS, etc.), and any of the activities you created during the course, you can post your lesson plan on the Discussion Board (which was optional during module 6) for your colleagues to critique. Then, you will make any needed revisions and implement ("try out") the task with at least three individuals (students, relatives, class, small group, etc.). (NOTE: You are not limited to using activities already discussed during this class, but I prefer that you select a Number and Operations topic, regardless of the grade or subject you teach. The format of the lesson plan is what is useful for you. In this program, you have learned about 5-E and in this course you learned about the TTLP format; in your district you may have a particular format - please use the format that is useful for you). For this assignment, I am grading the *implementation* and *your reflection* on the lesson – not the lesson plan itself.

After you have completed the steps above, you will write a case study (3-5 pages, double-spaced, *approximately*) describing an episode from the implementation of this task. This will not be a complete transcript of the activity, but it would be good to include some direct quotes from students and dialogue between the students, if possible. The episode needs to illustrate some aspect of children's mathematical thinking, critical mathematics and cognitive demand of task in its implementation, as well as your ability to reflect on that thinking, identify larger teaching issues raised for you by the episode you describe and/or maintaining the cognitive demand of the high level task. **NOTE: If you were not able to incorporate critical mathematics in the lesson plan, please include possibilities – I want you to begin thinking of how you can teach mathematics for social justice while not taking away from the high cognitive demand or the required content/standards** 

Remember, your case must touch on a mathematical topic involving whole numbers, rational numbers and operations. Please submit the lesson plan along with your Case Study. *However, only your case study will be graded.* 

You will post this assignment **both** in Tk20 and in Blackboard.

Tk20: There is no Tk20 assessment in this course.

**Professional Dispositions:** Each student/candidate in the College of Education at UTA will be evaluated on Professional Dispositions by the faculty and staff in each professional education course per semester. These dispositions are identified as essential for a highly-qualified professional. Instructors and program directors will work with students/candidates rated as "unacceptable" in one or more stated criteria. The student/candidate will have an opportunity to develop a plan to remediate any digressions. If digression(s) are not, or cannot be successfully remediated as in the case of an egregious digression, a determination will be made by Committee on continuation or dismissal from the College of Education.

**The College of Education Conceptual Framework** serves as a guide for our professional education programs. It highlights our commitment to excellence across courses and clinical experiences and reflects current research and alignment to professional standards. This document describes how we are dedicated to the development of highly skilled and ethical education professionals who are also intellectual and educational leaders. The UTA College of Education Conceptual Framework may be found at this link: http://www.uta.edu/coed/about/conceptual-framework.php

**Attendance:** At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I will take attendance based on your regular, weekly participation in the course. However, while UTA does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UTA instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

**Assignments.** Since this course is online, it is expected that all students will access the learning modules as required and complete all activities as directed in the module, which includes journal reflections, discussions, and assignments. Activities are to be completed and submitted *in Blackboard* by the posted deadline. Do not send ANY reflections, discussions or assignments via email. If you are having trouble submitting in Blackboard, email your Instructor *and* Instructional Associate to notify them of the issue, but all assignments and activities MUST be submitted via Blackboard. Emailed assignments *will not* be graded. The Sunday of Week 6, students can submit ONE assignment (from Module 1 through Module 5) to be re-graded for a higher grade if they earned a grade lower than a 90. The highest possible grade on the resubmission will be 85.

**Response Time and Feedback.** Students can expect to receive grades/feedback on assignments within 48 hours. Any questions about an assignment or course expectations should be sent to the course instructor and instructional associate (IA). Student emails will be answered within 48 hours as well.

Late Work. This is a 7-week course, so late work is strongly discouraged on any activity (which also includes journal reflections and discussion boards). Also, any assignment or post that is sent via email will not be graded and may be counted as late (see above). Please learn how to submit via Blackboard prior to the deadline and email your Instructor and Instructional Associate to notify them of any technical issues with submitting (this does not automatically make your assignment exempt from being counted as late). Any assignment that is late (submitted after the 11:59 p.m. deadline on the due date) will receive a **15% deduction** if it is one day late, a **25% deduction** if it is 2-3 days late and will not be accepted beyond 4 days late, regardless of the reason. This includes submitting a wrong assignment or submitting in the wrong location, so make sure you submit your correct assignment in the appropriate location in Blackboard. If it is late due to a technical difficulty, please email verification of such difficulty (i.e., screenshot of error message; email from tech support documenting difficulty, etc.) to the Instructor <u>and</u> your assigned Instructional Associate, however, this does not automatically make your assignment exempt from being counted as late.

**Grading**: Students in this course will engage in and complete three distinct types of *assessment activities* that will be used to measure the attainment of course concepts. These assessment activities are *Reflection Journals*, *Assignments*, and *Discussions*. An overview of these assessment activities are presented below. Detailed instructions and scoring rubrics for all assignments are included in the module in Blackboard for that assessment activity. The summary of grade distribution for assignments, discussions, and reflections is as follows:

Reflection Journals: 15% Assignments: 70% Discussions: 15% **Total Grade: 100%** 

## **Grade Calculation**

The points earned will be transformed to percentages. The grading system as per UTA policy is as follows:

A = 90 - 100 B = 80 - 89 C = 70 - 79 D = 60 - 69 F = Below 60

**Drop Policy:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<u>http://wweb.uta.edu/aao/fao/)</u>.

**Disability Accommodations:** UTA is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA),* and *Section 504 of the Rehabilitation Act.* All instructors at UTA are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of **a letter certified** by the Office for Students with Disabilities (OSD).\_ Only those students who have officially

documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting: **The Office for Students with Disabilities, (OSD)** www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services (CAPS) <u>www.uta.edu/caps/</u> or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

**Non-Discrimination Policy:** The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit <u>uta.edu/eos</u>.

**Title IX Policy:** The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit* www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.

**Academic Integrity:** Students enrolled all UTA courses are expected to adhere to the UTA Honor Code:

*I pledge, on my honor, to uphold UTA's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.* 

*I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.* 

UTA faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. Additional information is available at <a href="https://www.uta.edu/conduct/">https://www.uta.edu/conduct/</a>.

**Electronic Communication:** UTA has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <a href="http://www.uta.edu/oit/cs/email/mavmail.php">http://www.uta.edu/oit/cs/email/mavmail.php</a>.

**Campus Carry:** Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying

handguns is not allowed on college campuses. For more information, visit <a href="http://www.uta.edu/news/info/campus-carry/">http://www.uta.edu/news/info/campus-carry/</a>

**Student Feedback Survey:** At the end of each term, students enrolled in face-to-face and online classes categorized as "lecture," "seminar," or "laboratory" are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback via the SFS database is aggregated with that of other students enrolled in the course. Students' anonymity will be protected to the extent that the law allows. UTA's effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <a href="http://www.uta.edu/sfs">http://www.uta.edu/sfs</a>.

**Final Review Week:** for semester-long courses, a period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

**The English Writing Center (411LIBR)**: The Writing Center offers **FREE** tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at <a href="https://uta.mywconline.com">https://uta.mywconline.com</a>. Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see <a href="https://www.uta.edu/owl">www.uta.edu/owl</a> for detailed information on all our programs and services.

#### Library Resources library.uta.edu

- Research or General Library Help
  - Academic Plaza Consultation Services library.uta.edu/academic-plaza
  - Ask Us ask.uta.edu/
  - Library Tutorials library.uta.edu/how-to
  - o Subject and Course Research Guides libguides.uta.edu
  - o Librarians by Subject library.uta.edu/subject-librarians
  - Research Coaches <u>http://libguides.uta.edu/researchcoach</u>
- Resources
  - A to Z List of Library Databases libguides.uta.edu/az.php
  - Course Reserves pulse.uta.edu/vwebv/enterCourseReserve.do
  - FabLab fablab.uta.edu/

- Scholarly Communications (info about digital humanities, data management, data visualization, copyright, open educational resources, open access publishing, and more) <u>http://library.uta.edu/scholcomm</u>
- o Special Collections library.uta.edu/special-collections
- Study Room Reservations openroom.uta.edu/

# • Teaching & Learning Services for Faculty

- Copyright Consultation <u>library-sc@listserv.uta.edu</u>
- Course Research Guide Development, Andy Herzog amherzog@uta.edu or your subject librarian
- o Data Visualization Instruction, Peace Ossom-Williamson peace@uta.edu
- o Digital Humanities Instruction, Rafia Mirza rafia@uta.edu
- Graduate Student Research Skills Instruction, Andy Herzog <u>amherzog@uta.edu</u> or your subject librarian
- Project or Problem-Based Instruction, Gretchen Trkay gtrkay@uta.edu

## • OTHER RESOURCES

- Environmental Health & Safety (<u>http://www.uta.edu/ehsafety</u>)
- The Library's 2<sup>nd</sup> floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation. <u>http://library.uta.edu/academic-plaza</u>

## **Course Outcomes and Performance Measurement:**

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 1 Discuss number and operations concepts in all grades K-12	Reflection Journal: Burke, M. J., Kehle, P. E., Kennedy, P. A., & St. John, D. (2006). Introduction. In M. J. Burke (Ed.), <i>Navigating through Number and</i> <i>Operations in Grades 9-12</i> (pp. 1–11). Reston, VA: National Council of Teachers of Mathematics.
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 1 Discuss number and operations concepts in all grades K-12 Discuss lessons/activities that allow students to do the following : • Describe the decimal number system we use	<ul> <li>Group Discussion Board:</li> <li>Cases from Building a System of Tens (BST) and</li> <li>Making Meaning for Operations (MMO)</li> <li>BST Case 5: "Doesn't it take 100 of these to make 10,000"</li> <li>BST Case 9: "Groups and leftovers"</li> <li>BST Case 11: "How many thousands in 437,812?"</li> <li>MMO Case 9: Early multiplication</li> <li>MMO Case 11: "How do kids think about division?"</li> </ul>

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
	<ul> <li>Connect addition with subtraction and multiplication</li> <li>Connect subtraction with addition and division</li> </ul>	
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 1 Discuss number and operations concepts in all grades K-12	Reflection Journal: Sieve of Eratosthenes
Objective 1: Design activities that utilize state and/or national standards at varying grade levels. Objective 3: Create lessons/activiti es that allow students to become proficient in various math concepts.	Module 1: Discuss number and operations concepts in all grades K-12 Discuss/develop lessons/activities that allow students to do the following • Describe the decimal number system we use • Connect addition with subtraction and multiplication • Connect subtraction with addition and division Design activities that utilize the NCTM curriculum focal points, Common Core State Standards, Texas Essential Knowledge and Skills, or other state standards at varying grade levels	Group Discussion Board: Collaboration on a Whole Numbers and Operations Math Activity
Objective 1: Design activities that utilize state	Module 1: Develop lessons/activities that allow students to do the following	Module 1 Assignment: Reflection on Collaboration, Math Activity and Whole Number Concepts

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
and/or national standards at varying grade levels. Objective 3: Create lessons/activiti es that allow students to become proficient in various math concepts.	<ul> <li>Describe the decimal number system we use</li> <li>Connect addition with subtraction and multiplication</li> <li>Connect subtraction with addition and division</li> <li>Design activities that utilize the NCTM curriculum focal points, Common Core State Standards, Texas Essential Knowledge and Skills, or other state standards at varying grade levels</li> </ul>	
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 2 Discuss lessons/activities that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels	<ul> <li>Group Discussion Board:</li> <li>Gutstein, E. (2012). Reflections on teaching and learning mathematics for social justice in urban schools. In A.A. Wagner &amp; D. W. Stinson (Eds.), <i>Teaching mathematics for social justice:</i> <i>Conversations with educators</i>, 63-78. Reston, VA: NCTM</li> <li>Bartell, T. G. (2012). Is <i>this</i> teaching mathematics for social justice? Teachers' conceptions of mathematics classrooms for social justice. In A.A. Wagner &amp; D. W. Stinson (Eds.), <i>Teaching mathematics for social justice:</i> <i>Conversations with educators</i>, 113-125. Reston, VA: NCTM</li> </ul>
Objective 5: Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.	Module 2: Discuss lessons/activities that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels	Group Discussion Board: Plumb, A., Roberts-Caudle, C. M., Harper, F. K., & Jones, D. A. (2017, May). Flint, Michigan, water crisis: Connecting to local issues in mathematics classrooms. <i>Teaching Children</i> <i>Mathematics</i> , 23(9), 518-520.
Objective 1: Design	Module 2: Design and discuss lessons/activities	Group Discussion Board:

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
activities that utilize state and/or national standards at varying grade levels. Objective 3: Create lessons/activiti es that allow students to become proficient in various math concepts. Objective 5: Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.	<ul> <li>that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels.</li> <li>Develop lessons/activities that allow students to do the following: <ul> <li>Describe rational numbers</li> <li>Explain how to add and subtract rational numbers</li> <li>Explain how to multiply and divide rational numbers</li> <li>Connect equivalent fractions with factors and multiplication</li> <li>Connect mathematics to a social issue/concern</li> </ul> </li> </ul>	Collaboration on a Rational Number/Fraction Math Activity
Objective 1: Design activities that utilize state and/or national standards at varying grade levels. Objective 3: Create lessons/activiti es that allow students to become proficient in various math concepts.	<ul> <li>Module 2: Design and discuss lessons/activities that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels and cognitively demanding.</li> <li>Develop lessons/activities that allow students to do the following: <ul> <li>Describe rational numbers</li> <li>Explain how to add and subtract rational numbers</li> <li>Explain how to multiply and divide rational numbers</li> </ul> </li> </ul>	Module 2 Assignment: Reflection on Collaboration, Math Activity, and Rational Number Concepts

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
Objective 5: Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.	<ul> <li>Connect equivalent fractions with factors and multiplication</li> <li>Connect mathematics to a social issue/concern</li> </ul>	
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Discuss lessons/activities that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels.	Reflection Journal: Interactive videos "Find the Fractions" and "Logical Leaps"
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Collaborate with classmates on enhancing existing lessons/activities across grade levels. Discuss lessons/activities that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels.	Group Discussion Board: Dividing Fractions and Gregg, J., & Gregg, D. U. (2007). Measurement and fair-sharing models for dividing fractions. <i>Mathematics Teaching in</i> <i>the Middle School, 12</i> (9), 490-496.
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 2: Discuss lessons/activities that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels.	<ul> <li>Group Discussion Board:</li> <li>Cases from Making Meaning for Operations (MMO) <ul> <li>MMO Case 19: "Equivalent fractions"</li> <li>MMO Case 20: "Today's number is 1"</li> <li>MMO Case 23: "How many ways can you add 1/3 to ¼? Or, interesting stuff happens!"</li> <li>MMO Case 28: "Who says that's not the right equation? My own experience vs. students' thinking"</li> </ul> </li> </ul>

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model. Objective 2: Redesign existing lessons/activiti es across grade levels.	Collaborate with classmates on enhancing existing lessons/activities across grade levels. Focus on vertical alignment of rules, definitions and the varying number and operations concepts in grades K-12 Discuss lessons/activities that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels.	Group Discussion Board: Collaborating about Rules that Expire
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model. Objective 2: Redesign existing lessons/activiti es across grade levels.	Module 3: Focus on vertical alignment of rules, definitions and the varying number and operations concepts in grades K-12 Discuss lessons/activities that utilize the NCTM curriculum focal points, CCSS, TEKS, or other state standards at varying grade levels.	Module 3 Assignment: More Rules that Expire
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 4: Discuss lessons/activities that utilize the curriculum focal points, state/national standards at varying grade levels.	<ul> <li>Group Discussion Board:</li> <li>Cases from Building a System of Tens (BST)</li> <li>BST Case 24: "Parts of pennies"</li> <li>BST Case 28: "Representing decimals products"</li> <li>BST Case 29: "Why do we move the decimal anyway?"</li> </ul>

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model. Objective 1: Design activities that utilize state and/or national standards at varying grade levels. Objective 2: Redesign existing lessons/activiti es across grade levels. Objective 3: Create lessons/activiti es that allow students to become proficient in various math concepts.	Module 4 Design lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding tasks at varying grade levels. Collaborate with classmates on enhancing existing lessons/activities across grade levels. Develop lessons/activities that allow students to do the following: • Connect decimals, percents, and fractions	Group Discussion Board: Collaboration on a cognitively demanding Task that uses Decimals, Fractions and/or Percents Readings: Griffin, L. B. (2016, April). Decimal misconceptions: Strategic instructional choices. <i>Teaching</i> <i>Children Mathematics</i> , 22(8), 488-494. Smith, M. S., & Stein, M. K. (1998). Selecting and creating mathematical tasks: From research to practice. <i>Mathematics Teaching in the Middle</i> <i>School, 3</i> (5), 344-350. Stein, M. K., & Smith, M. S. (1998). Mathematical tasks as a framework for reflection: From research to practice. <i>Mathematics Teaching in the Middle</i> <i>School, 3</i> (4), 268-275. Smith, M.S., Bill, V. & Hughes, E.K. (2008, October). Thinking through a lesson: Successfully implementing high-level tasks. <i>Mathematics Teaching in the Middle</i> <i>School, 14</i> (3), 132-138.
Create lessons/activiti es that allow students to become proficient in various math concepts. Objective 4: Design mathematics activities and tasks that are cognitively demanding.		

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
Objective 5: Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.		
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 4 Design lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels. Develop lessons/activities that allow students to do the following:	Module 4 Assignment: Original Cognitively Demanding Tasks
Objective 1: Design activities that utilize state and/or national standards at varying grade levels.	<ul> <li>Connect decimals, percents, and fractions</li> </ul>	
Objective 2: Redesign existing lessons/activiti es across grade levels.		
Objective 3: Create lessons/activiti es that allow students to become proficient in		

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
various math concepts. Objective 4: Design mathematics		
activities and tasks that are cognitively demanding.		
Objective 5: Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.		
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 5 Discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels.	Reflection Journal: Ponce, G. A. (2007, August). It's all in the cards: Adding and subtracting integers. <i>Mathematics Teaching in the Middle</i> <i>School, 13</i> (1), 10.
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 5 Discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels.	Reflection Journal: Using Algeblocks to introduce and teach integers and integer operations
Objective 1: Design activities that	Module 5 Design lessons/activities that utilize the curriculum	Group Discussion Board: Vertical Alignment Collaboration on a Task on Integers

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
utilize state and/or national standards at varying grade levels. Objective 2: Redesign existing lessons/activiti es across grade levels. Objective 3: Create lessons/activiti es that allow students to become proficient in various math concepts.	focal points, state/national standards, and cognitively demanding at varying grade levels. Collaborate with classmates on enhancing existing lessons/activities across grade levels. Develop lessons/activities that allow students to do the following: • Understand integers and operations on integers.	
Objective 5: Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.		
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 5 Develop as a mathematics education professional through synth esis of scholarly articles on a topic of interest.	Module 5 Assignment: Professional Development Assignment
Objective 6:	Module 6	Reflection Journal:

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels.	Square root symbol
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 6 Discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels.	<ul> <li>Reflection Journal:</li> <li>Lewis, L. (2007). Irrational Numbers Can "In-Spiral" You. <i>Mathematics Teaching in the Middle School, 12</i>(8), 442-446. Retrieved from http://www.jstor.org.ezproxy.uta.edu/stable/41 182458</li> <li>Brown, R., &amp; Owens, A. (2009). Mathematical explorations: Tilted Squares, Irrational Numbers, and the Pythagorean Theorem. <i>Mathematics Teaching in the Middle School, 15</i>(1), 57-62. Retrieved from http://www.jstor.org.ezproxy.uta.edu/stable/41 182952</li> <li>Popovic, G. (2015). Irrational Numbers, Square Roots, and Quadratic Equations. <i>Mathematics Teaching in the Middle School, 20</i>(8), 468-474. doi:10.5951/mathteacmiddscho.20.8.0468</li> <li>Wasserman, N. H. (2014). A Rationale for Irrationals: An Unintended Exploration of e. <i>The Mathematics Teacher, 107</i>(7), 500-507. doi:10.5951/mathteacher 107.7.0500</li> </ul>
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 6 Design and discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels. Collaborate with classmates on enhancing existing lessons/activities across grade levels.	Group Discussion Board: Vertical Alignment Collaboration on a Task on Irrational Numbers
Objective 1: Design	Module 6	Module 6 and 7 Assignment: Case Study on a Critical Mathematics Task

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
activities that utilize state and/or national standards at varying grade levels.	Design and discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels.	
Objective 2: Redesign existing lessons/activiti es across grade levels.	Collaborate with classmates on enhancing existing lessons/activities across grade levels. Develop lessons/activities that allow students to do the following:	
Objective 3: Create lessons/activiti es that allow students to become proficient in various math concepts.	<ul> <li>Explain what irrational numbers are and why we need them</li> </ul>	
Objective 4: Design mathematics activities and tasks that are cognitively demanding.		
Objective 5: Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.		
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.		

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.	Module 7 Design and discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels. Collaborate with classmates on enhancing existing lessons/activities across grade levels. Develop lessons/activities that allow students to do the following: • Compare and contrast ratios with rational numbers • Connect ratios and proportions • Utilize multiplicative reasoning with ratios and proportions	Reflection Journal: Newton, K. J. (2010). The sweetest chocolate milk. <i>Mathematics Teaching in</i> <i>the Middle School</i> , <i>16</i> (3), 148– 153. Stevens, A., & Stevens, J. (2016). Using mathematics to elect the U.S. President. <i>Mathematics Teacher</i> , <i>110</i> (3), 192-198.
	Module 7 Design and discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels. Collaborate with classmates on enhancing existing lessons/activities across grade levels. Develop lessons/activities that allow students to do the following: • Compare and contrast ratios with rational numbers • Connect ratios and proportions	<ul> <li>Group Discussion Board: Newton, K. J. (2010). The sweetest chocolate milk. <i>Mathematics Teaching in</i> <i>the Middle School</i>, <i>16</i>(3), 148– 153.</li> <li>Lobato, J., &amp; Ellis, A. B. (2010). Ratios, proportions, and proportional reasoning: The big idea and essential understandings. In R. I.</li> <li>Charles (Ed.), <i>Developing essential</i> <i>understanding of ratios, proportions and</i> <i>proportional reasoning</i> (pp. 7–14). Reston, VA: National Council of Teachers of Mathematics.</li> </ul>

Course Objective(s)	Module Number and Objective(s)	Activity (Reflection Journal, Group Discussion Board or Module Assignment)
	<ul> <li>Utilize multiplicative reasoning with ratios and proportions</li> </ul>	
Objective 1: Design activities that utilize state and/or national standards at varying grade levels.	Module 7 Design and discuss lessons/activities that utilize the curriculum focal points, state/national standards, and cognitively demanding at varying grade levels. Collaborate with	Module 6 and 7 Assignment: Case Study on a Critical Mathematics Task
Objective 2:Redesign existing lessons/activiti es across grade levels.	classmates on enhancing existing lessons/activities across grade levels.	
Objective 3: Create lessons/activiti es that allow students to become proficient in various math concepts.		
Objective 4: Design mathematics activities and tasks that are cognitively demanding.		
Objective 5: Incorporate culturally and socially responsive educational practices, topics and strategies in educational planning.		

Course	Module Number and	Activity (Reflection Journal, Group Discussion
Objective(s)	Objective(s)	Board or Module Assignment)
Objective 6: Review knowledge and skills associated with whole number operations using a 5-E inquiry model.		

# As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. – Dr. Yolanda A. Parker.

**Emergency Phone Numbers**: In case of an on-campus emergency, call the UTA Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381