University of Alabama at Birmingham
MA 316-2D *Numerical Reasoning*
Fall 2021 T/Th 12:30-1:45pm HHB Rm 227

Instructor: Tami Puchta, Ed.S.
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Office Hours: I will be happy to set up a meeting time either in my office or via Zoom at a mutually convenient time. Please contact me through email to schedule a time. Meeting times will also be announced on Canvas.

Contact: Email is my preferred method of contact if you have questions. Please expect a response within 24 hours on weekdays and a slower response on weekends.

Required Text: There is no required text for this course, but there will be assigned readings provided on Canvas. You will need graph paper, a ruler, color pencils, and scissors and tape for various tasks.

Course Description

This mathematics course will focus on numerical reasoning and problem solving. It is designed around the National Council of Teachers of Mathematics standards and is intended for future elementary and secondary teachers. Working in small groups and individually, students will investigate a variety of problems using numerical reasoning. Students will also explore models to help K-8 students understand operations on and properties of real numbers including integers, fractions, percentages, decimals, rational and irrational numbers. Students will investigate problems focused on ratio and proportional reasoning.

This is an inquiry-based course in which students will use mathematics to describe, understand, and solve problems. Each topic will be studied with emphasis on reasoning, problem solving, developing mathematically convincing arguments, and the clear communication of mathematical ideas. This course emphasizes conceptual understanding as well as procedural fluency and stresses the importance of examining problems from multiple perspectives: numerical, verbal, algebraic, and geometric. Students will have mathematics homework as well as out-of-class readings which will require written reflections.

Learning Outcomes

1. Demonstrate a strong conceptual understanding of the properties of numbers (whole numbers, fractions, equivalent fractions, percentages, integers, rational numbers, decimals, irrational numbers, real numbers).
2. Demonstrate a strong conceptual understanding of operations on numbers (whole numbers, fractions, equivalent fractions, percentages, integers, rational numbers, decimals, irrational numbers, real numbers).
3. Demonstrate knowledge of concepts of number and number relationships, number systems, estimation, and computation in the context of problem solving.
4. Demonstrate knowledge of concepts of number theory in the context of problem solving.
5. Compute and estimate fluently using integers, rational numbers, and decimals, including both written and mental strategies.
6. Model and solve a variety of theoretical and applied problems
7. Model and solve problems involving ratios, rates, and proportional reasoning, and distinguish between proportional and non-proportional relationships.
8. Use and convert units appropriately when solving problems.
9. Effectively and clearly communicate mathematical ideas orally and in writing.

10. Demonstrate a positive disposition toward, persistence in problem, solving and reflection in doing mathematics.
11. Demonstrate the ability to interact within groups, and with the class as a whole, while demonstrating cognizance of working with students at different levels.

The goal of this course is that you become a mathematically powerful student and that you become a <u>competent</u> and <u>confident</u> problem solver. The content and experiences in this course will lead you toward this goal. My role as the instructor will be to guide and support you as you make sense of mathematics. My role is not to tell you everything about the subject or to answer all questions that will arise as you engage in problem solving. You will at times experience confusion and perhaps frustration which is a natural part of the learning process. I will try to help you work your way out of confusion before your frustration becomes debilitating to your learning. Don't be afraid of wrong answers as learning sometimes occurs by multiple attempts down wrong paths until you find a correct path.

You will learn while working in teams, in pairs, and as an individual as you solve problems. Engaging with others in collaborative problem solving will help you appreciate a variety of points of view. For many problems, I will insist that you not be satisfied with simply finding one way to solve a problem. While getting the right answer is a goal in solving a problem, understanding how you got to the answer and communicating your understanding to others is also important. Collaborative learning is encouraged; however, you are individually accountable for learning the material.

Course Requirements

1. **Attendance** and **active participation** in all sessions. **Since participation in group tasks is an essential component of this course, missing more than 25% of classes with unexcused absences will result in a grade of F for this course. Two or more unexcused absences will result in a lower final grade.**
2. You may collaborate on solving the menu tasks. However, it is imperative that you are able to solve problems on your own for assessments.
3. Complete individual menus of problems, group tasks, and homework problems. Graduate students are required to complete four additional and more complex problems for Menus 1 and 2. These will be distributed in class.
4. Complete article reviews and other readings.
5. Complete an in-class Midterm Performance Task and a Final Performance Task.
6. Develop a final Mathematics Portfolio. Directions will be provided on Canvas.
7. Complete a final mathematics task to be included in your Portfolio. This task will be distributed in class and is in addition to the Portfolio tasks described on Canvas.
8. Have a positive and productive disposition toward yourself, your classmates, and mathematics. Be respectful of others as you share ideas.

Assignments	% of Final Grade	Out of 480 total points
Math Menus (2)	22.5	108
Article Reviews	12.5	60
Midterm	22.5	108
Mathematics Portfolio	10	48
Final	25	120
Participation/In-class tasks*	7.5	36

Percent Earned	Final Grade
92-100	A
82-91	B
72-81	C
<65	F

***Participation points are meant to recognize those who put forth a maximum effort and demonstrate persistence in problem solving.** The instructor will use her best professional judgment in awarding points. 7.5% will be awarded to students who:
- have one or fewer absences (and make up the work for any absences)
- actively participate in all group and independent tasks
- demonstrate persistence in pursuing challenging problems and tasks
- show craftsmanship in solving problems and seek to extend their thinking on problems
- show the ability to work independently on tasks
- demonstrate the ability to work effectively with others on tasks
- complete all required tasks on the menus
- give good faith attempts on some of the desserts on the menus

If in the judgment of the instructor a student fails to meet all of the above, the instructor will assign a score between 0 and 7.5% with appropriate credit given for partial successes in meeting course goals. The instructor's decision here is based on her professional experience and is the final judgment on this item.

Attendance and Tardiness/Early Departure Policy
Attendance every day is expected and essential to success. Please be on time to class and let me know as soon as possible if it is necessary to miss class. **Class roll will be recorded for each class. Two or more unexcused absences will negatively impact your final grade.** You are responsible for content covered during your absence. Tardiness to class and early departures are disrespectful to the instructor and your classmates.

Late Assignments/Revisions
All assignments are due at the indicated/assigned due date and time in Canvas unless otherwise instructed. In the event the instructor will accept a late assignment, ten percent of the assignment grade will be deducted per day late. No revisions will be possible unless requested by the instructor. If the instructor requests a revision of an assignment, the grade you receive will be an average of the first and second attempts. **Once an assignment closes on Canvas, no late submission will be permitted except in extreme circumstances**.

Exams – Section 2D
An online midterm and a final are scheduled for this class. The midterm will occur during a regular class time and the final will take place during the scheduled final time for this section. See the UAB Final Exam Schedule here. Make-up exams will be scheduled only when requested within the first week of the term for a valid and verifiable reason or in case of an extreme emergency.

Time Commitment
This class meets twice per week for 1.5 hours each. In addition to class time, you should spend about 6 hours per week reading, studying, preparing for class discussions, and/or completing assignments.

UAB Policies

Add/Drop and Course Withdrawal

- Drop/Add: Deadlines for adding, dropping, or withdrawing from a course and for paying tuition are published in the Academic Calendar available online. Review the Institutional Refund Policy for information on refunds for dropped courses.
- Withdrawal: To avoid academic penalty, a student must withdraw from a course by the withdrawal deadline shown in the academic calendar and receive a grade of W (withdrawn). Failure to attend class does not constitute a formal drop or withdrawal.

Academic Misconduct

The University of Alabama at Birmingham expects all members of its academic community to function according to the highest ethical and professional standards.

Academic dishonesty and misconduct includes, but is not limited to, acts of abetting, cheating, plagiarism, copying homework, fabrication, and misrepresentation. Students are expected to honor the UAB Academic Integrity Code.

DSS Accessibility Statement

UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact DSS to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call (205) **934-4205**, visit their website, or their office located in Hill Student Center Suite 409.

Non-harassment, hostile work/class environment

The UAB College of Arts and Sciences expects students to treat fellow students, their Course Instructors, other UAB faculty, and staff as adults and with respect. No form of hostile environment or harassment will be tolerated by any student or employee. In this class, we will only use constructive criticism and will work to build a community of life-long learners.

Title IX Statement

UAB is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct we encourage you to report the incident. For more information about Title IX, policy, reporting, protections, resources and supports, please visit http://www.uab.edu/titleix for UAB's Title IX Policy, UAB's Equal Opportunity, AntiHarassment Policy and Duty to Report and Non-Retaliation Policy.

Health and Safety

UAB is very concerned for your continued health and safety. Please consult the "Students" section of UAB United for up-to-date guidance because the following information is subject to change as circumstances require.

We strongly urge you to be fully vaccinated. Here is information on the safety of vaccines and on how to get vaccinated at UAB. There are also incentives for getting vaccinated.

Mask-wearing has proven to be one of the most successful mitigation strategies used to combat spread of the various variants of the COVID-19 virus. UAB requires face coverings indoors on campus—regardless of vaccine status. Students who do not follow this requirement can be reported to Student Conduct.

The **following resources** available to you to help you be successful:

- Student Assistance & Support provides individualized assistance to promote student safety and well-being, collaboration and resilience, personal accountability, and self-advocacy. The Care Team consults and collaborates with campus partners to balance the needs of individual students with those of the overall campus community. The UAB Care Team helps find solutions for students experiencing academic, social and crisis situations including mental health concerns.

- Disability Support Services assists students with in reaching accommodations for their educational experiences at UAB that ensure that they have equal access to programs, services, and activities at UAB.

- The Vulcan Materials Academic Success Center provides tutoring, supplemental instruction, and other services that encourage goal achievement and degree completion.

- UAB Student Health Services delivers comprehensive, high quality, confidential, primary healthcare to students. Student Health provides testing services and vaccination clinics.

- Student Counseling Services offers students a safe place to discuss and resolve issues that interfere with personal and academic goals. UAB has created a new app (available in the App Store and Google Play) called B Well, that is designed to easily access resources on mobile devices and build a self-care plan.

- eLearning and Professional Studies provides numerous academic technologies and learning resources for students whose learning may be affected by COVID.

Syllabus Changes: This syllabus is subject to changes announced on Canvas.