THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

MA516 – 2D Numerical Reasoning

3 credit hours Tu/Th 12:30-1415 HHB Room 227

Course Syllabus Fall 2024

Instructor Information

Email is the preferred method of contact if you have questions. Include **MA516-2D** in the subject line of your email for a faster response. Please expect a response within 24 hours on weekdays and a slower response on weekends.

Available office times for students:

I am available to meet with you in person or virtually via Zoom by appointment.

- **In-person office hours** will be in Room 4039 of University Hall on Tuesdays between 2:10 & 4:10
- **Zoom meetings** are scheduled for the Central Time Zone and may be accessed using this Zoom link: https://uab.zoom.us/j/5447109945
  Zoom meetings by appointment at mutually agreed upon times.

This course helps fulfill the math requirements for ECE and ELE majors and is required for mathematical reasoning students. It may not be used to fulfill the general studies math requirement of UAB. MA313 should be considered as a prerequisite.

This class meets Face-to-Face meaning it will be conducted in person, on campus, on the days and times listed in the course schedule. There will also be assigned tasks submitted both on paper and electronically on Canvas.

Note: Print a copy of this syllabus for easy reference about due dates, grading scale, and helpful links for student support. The syllabus is the official document, but dates may change for various reasons. If there are changes, you will be notified.

Divisive Concepts

All University faculty, instructors, and teaching staff have the academic freedom to explore, discuss, and provide instruction on a wide range of topics in an academic setting. This class may present difficult, objectionable, or controversial topics for consideration but will do so through an objective, scholarly lens designed to encourage critical thinking. Though students may be asked to share their personal views in the academic setting, no student will ever be required to assent or agree with any concept considered "divisive" under Alabama law, nor penalized for refusing to support or endorse such a concept. All students are strongly encouraged to think independently and analytically about all material presented in class and may express their views in a time, place, and manner consistent with class organization and structure, and in accordance with the University's commitment to free and open thought, inquiry, and expressions.

Shared Values Statement

Collaboration, integrity, respect, and excellence are core values of our institution and affirm what it means to be a UAB community member. A key foundation of UAB is diversity. At UAB, everybody counts every day. UAB is committed to fostering a respectful, accessible, and open campus environment. We value every member of our campus and the richly different perspectives, characteristics, and life experiences that contribute to UAB's unique environment. UAB values and cultivates access, engagement, and opportunity in our research, learning, clinical, and work environments. Our [School] aims to create an open and welcoming environment and to support the success of all UAB community members.

Course Information

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.

Course Objectives

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 mathematically powerful students and that you become competent and confident problem solvers. 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. Sometimes learning 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 see several ways of solving a problem and appreciate a variety of points of view. Each person must think for her/himself and make sense of the situation. 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.

Required Text and Course Materials

There is no official textbook for this course. **You will need graph paper, a ruler, colored pencils or pens, and a way to organize handouts from class**.

Course Grading and Policies

Late Assignment Policy

Late assignments are eligible for a 10% deduction of original points for each day that they are late, up to three days. You must have a legitimate reason to receive a deadline extension, and you should contact me as soon as you know that you will not be able to meet the deadline.

Grading Scale – See chart below.

Assignments

Since participation is an essential component of this course, missing more than 25% of classes will result in a grade of F for this course.

Assignments	Percent of Final Grade	Points Value (out of 480)		Percent Earned	Final Grade
Math Menus (2)	22.5	108		92-100	A
Article Review	12.5	60		82-91	B
Midterm	22.5	108		70-81	C
Mathematics Portfolio	10	48		<70	F
Participation/Attendance**	7.5	36			
Final	25	120			

** **The participation score is intended 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 the 7.5% for this item based on a student's full participation in class activities and attempts at completion of challenging tasks. **7.5 percent will be awarded to students who: have few or no 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, stay on task without reminders during class activities, show the ability to work independently on tasks, demonstrate the ability to work with others on tasks without providing too much assistance, complete all required tasks on the menus and give good faith attempts at 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.

Rounding Policy

Individual assignment grades will not be rounded up. Final grades will be rounded up from 0.5 for students who have excellent attendance and who have completed all assignments.

Student Access to Grades

Grades for most written assessments will be available one week after the due date. Assignments will be described in detail during class and are also described on the appropriate Canvas assignment pages.

Time Commitment

You are expected to spend a substantial amount of time working through the course activities and assignments every week. Please know that time management and self-motivation are key components for success in this course and courses in general. There is a lot to be gained in this course so approach it with an open mind! In addition to class time, you should spend about 6 hours per week reading, studying, preparing for class discussions, and completing assignments and assessments.

Attendance

The **Undergraduate Catalogue policy on attendance** states, "*UAB recognizes that the academic success of individual students is related to their class attendance and participation."*
Class participation, contribution, and communicating ideas are crucial for learning to reason mathematically. Therefore, class attendance is mandatory. The following attendance policy will be applied:
For every unexcused absence above two, a student's final grade will be reduced by 2 points. More than 7 absences will result in an automatic "F."

Example:

- Final grade = 90
- 6 unexcused absences (4 above maximum permitted)
  - 90 - 8 = 82% final grade

Success in this course requires you to be present and fully engaged. Therefore, you are expected to attend class, participate in discussions by sharing your ideas while also being respectful of other's ideas. Additionally, you are expected to refrain from distractions during class (texting, websites not pertinent to the discussion, etc.).

Inclement Weather

Classes will be canceled for weather only if the University cancels classes. Otherwise, you are expected to be present in class. **UAB Emergency Management** will be the official source of UAB information during any actual emergency or severe weather situation. The UAB Emergency Management Team will use B-ALERT, the university's emergency notification system, to communicate through voice calls, SMS text messages and emails to the entire campus all at the same time. To register for B-ALERT or update your existing information in the system, go to **uab.edu/balert**. All registration is connected to your BlazerID.

Weekly Course Schedule

The course schedule with assignments is located on the Canvas home page.

UAB Policies and Resources

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.** Review the **Institutional Refund Policy** for information on refunds for dropped courses. It is the student's responsibility to initiate add/drop procedures. Students may drop and add courses online after they have registered and until the drop/add deadline using BlazerNET.

- 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. The official course withdrawal must be completed online in BlazerNET.

Academic Integrity Code

Your success while at UAB and after graduation is valued by the University. To gain and grow in the knowledge and skills needed for your future career, it is vital that you complete your own work in your courses and in your research. The purpose of the **Academic Integrity Code** is to support our academic mission and to maintain and promote academic integrity. All students in attendance at UAB are expected to pursue all academic endeavors with integrity, honor, and professionalism and to observe standards of conduct appropriate to a community of scholars.

Please be sure you understand the different forms of "academic misconduct" covered by the code. See what UAB students say about academic integrity and review the FAQs about the code on the **Student Academic Integrity webpage**.

Academic Policy Appeal

Students should request an Academic Policy Appeal when the student cannot continue in a course for reasons that are outside of the strict qualifications under this policy. Students need to submit supporting documentation showing why they cannot continue in a course. Learn more about the Academic Policy Appeal and how to submit an appeal form by visiting the **Academic Policy Appeal webpage**.

Grading Policies and Practices

UAB provides many Grading Policies to students such as Study Abroad Grading Policy, Grade Change Policy, Course Repeat, and University Forgiveness Policy. View more about the polices in the Grading Policies and Practices section of the **Undergraduate Catalog**.

Artificial Intelligence Use

Academic Integrity

Academic misconduct is present in an academic work wherever AI assistance has been used when unauthorized, or when authorized, has not been disclosed as required. Such behavior is considered deceit and a violation of UAB's shared commitment to truth and academic integrity. Deceit constitutes academic misconduct and is subject to review according to UAB's Academic Integrity Code.

AI for Written Assignments in this course:

- **The use of generative AI tools is *not* permitted on writing assignments in this course.** By submitting a writing assignment, you attest that you are the only and original author.

Student Conduct Code

The purpose of the University of Alabama at Birmingham ("University") student conduct process is to support the vision, mission, and shared values of the University and the tenets of the University's creed, The Blazer Way. Through a student-focused and learning-centered lens, the process strives to uphold individual and community standards; foster an environment of personal accountability for decisions; promote personal growth and development of life skills; and care for the well-being, health, safety, and property of all members of the University community.

The **Student Conduct Code** ("Code") describes the standards of behavior for all students and student organizations and outlines students' rights and the process for adjudicating alleged violations. It is set forth in writing in order to give general notice of non-academic prohibited conduct. The Code should be read broadly and is not designed to define non-academic conduct in exhaustive terms. All students and student organizations are expected to conduct themselves in accordance with the Code. The current version of the Code, which may be revised periodically, is available from the Office of Community Standards & Student Accountability.

Intellectual Property

My lectures and course materials, including PowerPoint presentations, quizzes, exams, outlines, and similar materials, are protected by copyright. You may take notes and make copies of

course materials for your own use. You may not and may not allow others to reproduce or distribute lecture notes and course materials publicly, whether or not a fee is charged, without my expressed written consent.

DSS Accessibility Statement

Accessible Learning: UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under the Americans with Disabilities Act (ADA) and/or 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 me 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 or visit **the DSS website**.

Title IX Statement

In accordance with Title IX, the University of Alabama at Birmingham does not discriminate on the basis of gender in any of its programs or services. The University is committed to providing an environment free from discrimination based on gender and expects individuals who live, work, teach, and study within this community to contribute positively to the environment and to refrain from behaviors that threaten the freedom or respect that every member of our community deserves. For more information about Title IX, policy, reporting, protections, resources, and supports, please visit the **UAB Title IX webpage**.

Violence Prevention and Response Policy

The University of Alabama at Birmingham (UAB) is committed to maintaining a safe and secure educational environment and workplace, one which seeks to ensure the well-being and safety of faculty and staff, employees, students and visitors. Violence and threatened violence are prohibited by UAB. Each member of the UAB community has the responsibility to understand, prevent, and respond appropriately to campus/workplace violence. For more information, view the **Violence Prevention and Response Policy**.

Technology

Access technical support and view privacy policies and accessibility statements for Canvas and other technologies on the Student Learning Technologies website. Additionally, view information about the Minimum System Requirements and Technical Skills.

Canvas Alerts

I may send alerts to students based on Canvas course information, such as current grades in the course, online attendance (login records), assignment due dates, and assignment scores. The alert is sent as an email to the student's UAB email address.

Health and Safety

UAB is very concerned for your continued health and safety. Please consult the **Student Health Services webpage** for up-to-date guidance because the following information is subject to change as circumstances require.

We strongly urge you to be fully 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. View information on the Immunization Requirements and Policies of the University on the **Student Health Services Immunizations webpage.**

Student Academic and Support Services

One Stop Student Services provides a single point of professional integrated service to students. The One Stop serves students who need assistance with academic records, financial aid, registration, student accounting, ONE card, and other related topics.

- **Student Assistance and 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 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.

- The **University Writing Center** offers free writing assistance for all UAB students. Get help at any stage of the writing process and with any type of writing. Students may meet with a tutor in person or via Zoom. Students may also upload a paper for feedback (called eTutoring in the online system). During in-person and Zoom sessions, tutors can help you understand your assignment, develop and organize your ideas, use and cite sources, revise and edit your draft, and more. When you upload a draft for eTutoring, tutors can provide feedback on both big-picture issues and detail-oriented concerns; please note that you must upload a draft and assignment sheet to use eTutoring.

  To make an appointment or get more information, please see the **UWC website**, email **writingcenter@uab.edu**, or call 205-996-7178. Follow the UWC on **Facebook**, **Instagram**, and **LinkedIn** for daily news and quick writing tips.

- **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. **Kognito** is a free, interactive simulation-based platform designed to help you talk with someone when you are worried about your mental health.

- **UAB Blazer Kitchen at the Hill Student Center** provides food and basic supplies for any UAB student in need through in-person or online shopping. Students who can are also able to donate food and supplies to assist their peers. To get more information, call 205-975-9509, email **studentoutreach@uab.edu**, or visit the **Student Assistance & Support website.**

- The **Office of Learning Technologies** provides numerous academic technologies and learning resources for students.

- **UAB Emergency Management** will be the official source of UAB information during any actual emergency or severe weather situation.

The following are the various websites describing additional student academic and technology resources:

- **UAB Policies for Students**

- **Student Academic and Support Services**

- **Technology Resources**

See also the **Student Assistance & Support** website of Student Affairs for a description of Covid-19-related resources, including the laptop loaner program.

Peers' Contact Information

I encourage students to reach out and obtain contact information of up to three classmates. This will be helpful in the event of an absence, forming study groups, or communicating schedule changes, etc.

Contact 1	Contact 2	Contact 3
Name: Email: Phone Number:	Name: Email: Phone Number:	Name: Email: Phone Number:

Syllabus: This syllabus is subject to changes announced in class and/or on Canvas.