

University of Alabama at Birmingham
MA 514-2D Geometric & Proportional Reasoning
Spring 2025 Tu/Th 12:30-1:45 pm UH Room 2010

Instructor Information

Name: Tami Puchta

Email: tpuchta@uab.edu

Phone: 205 934-2154

Office Location: Room 4039

Preferred Method of 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. Include the course number and section in the subject line of your email for a faster response.

Available office times for students:

- **In-person office hours** will be in **Room 4039 of University Hall** on **Tuesdays** and **Thursdays** between **2:00 & 3:10** and **after class at 4:45**.

- **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.

Text & Supplies: There is no official textbook for this course. You will need **unlined paper, a ruler, colored pencils or pens, a protractor, and a good compass**.

Prerequisite: MA 313/513 (Patterns, Functions, and Algebraic Reasoning)

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 Description

This course will continue the methods and inquiry-based learning environment similar to that established in MA 313/513 and is primarily intended for future or practicing elementary and secondary teachers. It will continue to focus on problem solving and making sense out of mathematics. The content focus will be around

number systems and number sense, geometry, measurement, and proportional reasoning. Students will develop inductive and deductive reasoning skills and will make and explore conjectures about mathematical concepts. Justification of ideas leading toward formal proof will be developed within the course. Students will experience mathematics through hands-on investigations using manipulatives and appropriate technologies. Collaborative learning will be one of the primary modes of instruction. Students are expected to communicate mathematics verbally and in writing through small group, whole group, and individual interactions.

Course Content

- Analysis of one, two, and three dimensional features of real objects
- Identification, classification, and transformations of geometric figures (similarity and congruence, position, orientation, etc.)
- Geometric constructions of given shapes, angles or lines
- Linear, area, and volume measurement including standard and non-standard measurement as well as error analysis
- Ratio and proportionality
- Analysis of three dimensional objects and their two-dimensional nets
- Coordinate graphing
- Number theory (square numbers, triangular numbers, powers, properties of numbers)
- Collecting, organizing, and analyzing data
- Inductive and deductive reasoning
- Mathematically convincing arguments (leading to mathematical proofs)
- Algebraic analysis of one, two and three-dimensional growth patterns

Learning Outcomes

1. Apply inductive and deductive reasoning to problems.
2. Identify properties of geometric figures and apply these in classification schemes and problems.
3. Apply knowledge of properties of a given category of shapes to identify unique figures in a set of shapes.
4. Apply problem-solving strategies to a variety of problems.
5. Find the perimeter, area, and volume of standard (polygonal) and non-standard regions/objects.
6. Apply measurement skills using non-standard measures as well as the metric and English measurement systems.
7. Demonstrate knowledge of concepts of number and number relationships, number systems, number theory, estimation, and computation in the context of problem solving.
8. Apply knowledge of ratio, proportions, similarity, and congruence in solving problems.
9. Apply transformations and the use of symmetry in solving problems.
10. Communicate mathematical ideas orally and in writing including making conjectures and expressing mathematically convincing arguments to justify claims.
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
12. Demonstrate a positive disposition toward persistence and reflection in doing mathematics.

One 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. True understanding will come when *you* make sense of a situation. My role is not to tell you everything about the subject, nor is it to answer all of the questions that will arise as you engage in problem solving. You will at times experience

confusion and perhaps frustration. This is a natural part of the learning process. I will try to help *you* reflect and 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.

Course requirements

- Attendance and active participation in all sessions. Two or more absences will lower your final grade. Because active group participation is an essential component of this course, missing 25% of classes or more will result in a grade of F for this course.**
- Complete individual menus of problems, group tasks, and homework problems. If you must miss class, you are expected to complete any missed group work or tasks from the missed class. You may collaborate on solving the menu tasks. However, it is imperative that you are able to solve problems independently on the exam.
- Complete article reviews and other readings. Full directions and expectations for these assignments will be on Canvas.
- Complete an in-class Midterm Performance Assessment and a Final Performance Assessment
- Develop a Mathematics Portfolio. Directions will be provided on Canvas.
- Complete a long-term task that will be assigned at the beginning of the semester. A portion of this work will be submitted with Menu 2 and the remaining piece will be submitted with your Mathematics Portfolio near the end of the semester.
- Have a positive and productive disposition toward yourself, your classmates, and mathematics. Be respectful of fellow classmates and the instructor as you share ideas.

Evaluation & Assignments

Students earn their grade in the course as determined in the table below. Important due dates will be listed on CANVAS.

Assignments	% of Final Grade	Points (out of 480)
Math Menus (2)	20	48 each
Engagement/In-Class Assignments*	10	48
Article Reviews/ Discussion (2)	8	20 each
Midterm	25	120
Mathematics Portfolio	10	48
Final	27	128

Percent Earned	Grade
92-100	A
82-91	B
72-81	C
71 and below	F

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

*Item 2 recognizes those who put forth a maximum effort and demonstrate persistence in problem solving. The instructor will use her best professional judgment in awarding the 10% for this item based on a student's full participation in class activities, attempts at completion of challenging tasks, and may be influenced by a student's attempts or non-attempts at dessert items from the menu problems. Ten percent 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 with others on tasks without providing too much assistance, complete

all required tasks on the menus, and 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 10% 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.

Course Policies

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.

Cell Phones and Other Devices

Let me know in advance if there is an important reason for you to be accessible by phone during class. Please silence your cell phone so you can be fully present to the members of our class and your small groups. Other devices are not permitted in class unless otherwise approved by the instructor.

Exams

A make-up exam will be scheduled only when requested within the first two days of the term for a valid and verifiable reason or in case of an extreme emergency.

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 taken** at the beginning of each class period and recorded. Always sign in as documentation of your attendance and punctuality. Tardiness to class and early departures are disrespectful to the instructor and your classmates. It is your responsibility to talk with your peers regarding what you missed, ask classmates to turn in your assignments, etc. You will be held responsible for content during your absence. **Since group participation is an essential component of this course, missing 25% or more of classes will result in a grade of F for this course.**

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, 10% 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.

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](#). 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 policies 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.