

MONTGOMERY COLLEGE

Course Syllabus

Mathematics, Statistics, and Data Science Department

I. Contact Information

Professor: Zhou Dong

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Phone: (240) 567-7810

Office: HT 134 Germantown campus

Office Hours:

Monday 10:30 am – 12:30 pm	Drop-in or appointments
Wednesday 10:30 am – 12:30 pm	Drop-in or appointments
Friday 10:30 am – 12:30 pm	By appointment only

[Click here to book an appointment](#)**II. General Course Information**

Elements of Mathematics II: Geometry and Algebra – MATH 131

4 SEMESTER HOURS - This course covers proportions, percents, and real numbers; basic geometry that includes congruence, similarity, symmetry, and transformations; measurement and coordinate geometry; and algebra emphasizing multiple representations. Intended for elementary education majors, this course is also suitable for parents of school-age children.

PREREQUISITE:

A grade of C or better in MATH 130 or consent of department.

Spring 2024

Section	CRN 30970
Class Meetings	TR 10:00 am – 11:40 am
Classroom	HT 138

III. Common Course Student Learning Outcomes

Upon course completion, a student will be able to:

- Reason about how quantities vary together in a proportional relationship, using tables, double number lines, and strip diagrams as supports.
- Distinguish proportional relationships from other relationships, such as additive relationships and inversely proportional relationships.
- Employ different methods for solving problems involving proportions and percents.
- Employ procedures for mental computation and estimation of percents.

- Use unit rates to solve problems and to formulate equations for proportional relationships.
- Use pictorial models to represent proportions and percents.
- Illustrate the connection between fractions and division, and how fractions, ratios, and rates are connected via unit rates.
- Recognize algebraic reasoning in elementary mathematics.
- Apply processes of reasoning to identify, solve, manipulate, and/or evaluate expressions, equations, and systems of equations.
- Translate among multiple representations of a function.
- Recognize various representations and change patterns of linear and non-linear functions.
- Solve problems with tables, graphs, and equations.
- Find and describe patterns including finding the n th term of a sequence.
- Explain, apply, and connect the general principles of measurement, the process of iterations, and the central role of units.
- Explain area and volume and give rationales for area and volume formulas that can be obtained by finitely many compositions and decompositions of unit squares or unit cubes.
- Explain common metric benchmarks for length, mass, and capacity and make conversions within the metric system.
- Develop basic area formulas and the Pythagorean Theorem in a deductive sequence and use these formulas to compute area and length.
- Describe, compare, classify, and draw plane and space figures.
- Explain the relationship among the formulas for the volume of prisms, cylinders, pyramids, and cones.
- Use nets to explain how to find the surface area of prisms and cylinders.
- Reason about proportional relationships and similarity.
- Perform rigid motions and relate them to congruence, symmetry, and similarity.
- Explain the sum of angle measures in a polygon and compute the measures of specific angles.
- Perform basic compass constructions and explain why they work.
- Use technology to study plane figures.
- Interpret statements that use geometric terminology.
- Prove or disprove conjectures about geometric shapes.

IV. Textbooks, Workbooks, and Supplies

Required materials for the course:

- *Mathematics for Elementary and Middle School Teachers with Activities* (6th edition), by Sybilla Beckmann, Pearson, 2021. (The ebook is available with MyLabMath).
- *MyLab Math Access Code* – for access to online assignments and the ebook

To register for MATH 131 Elements of Mathematics II: Geometry and Algebra:

1. Go to <https://mlm.pearson.com/enrollment/dong36240>.

2. Sign in with your Pearson student account or create your account.
3. Select any available access option, if asked.
 - Enter a prepaid access code that came with your textbook or from the bookstore.
 - Buy instant access using a credit card or PayPal.
 - Select Get temporary access without payment for 14 days.
4. Select Go to my course.
5. Select MATH 131 Elements of Mathematics II: Geometry and Algebra from My Courses.
6. If you contact Pearson Support, give them the course ID: dong36240

To sign in later:

1. Go to <https://mlm.pearson.com>.
 2. Sign in with the same Pearson account you used before.
 3. Select MATH 131 Elements of Mathematics II: Geometry and Algebra from My Courses.
- *Calculator* - A calculator is strongly recommended. If you do not have a calculator, Desmos (www.desmos.com/calculator) or the app may be used for homework and classwork. Note that use of phones and computers are NOT permitted on exams – you may borrow calculators from the MAPEL Center in SA 202.

V. Course Design

A. Bloom's Taxonomy

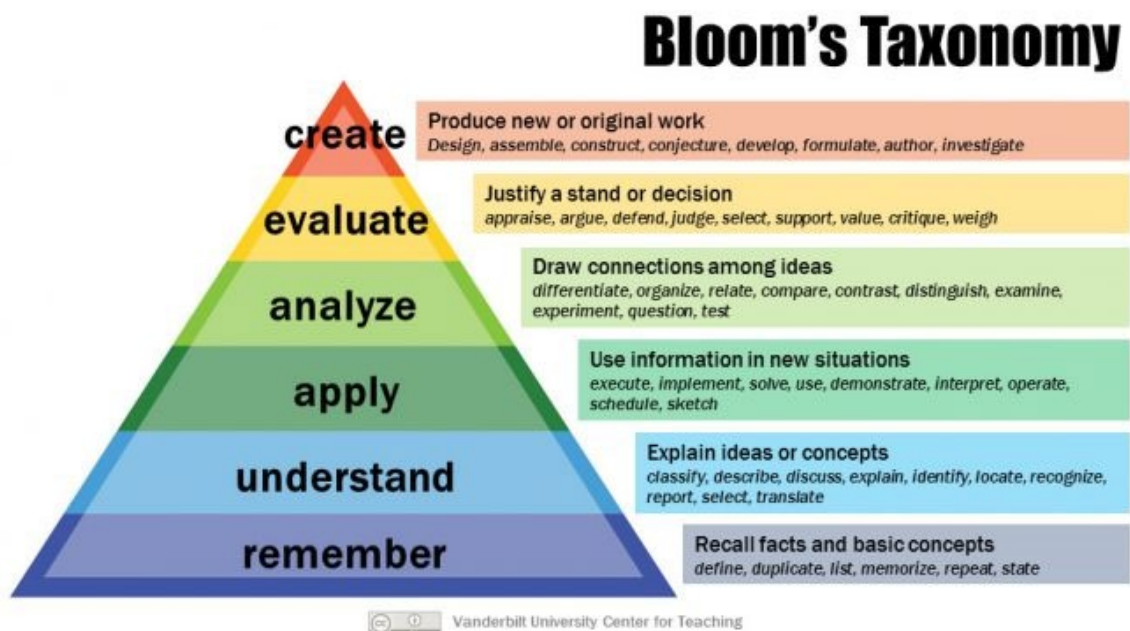


Figure 1 - Bloom's Taxonomy, from <https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/>

This class has been designed based on Bloom's Taxonomy. A basic understanding of Bloom's Taxonomy will help the student understand the course design take charge of their own learning.

B. Flipped Classroom Instruction

The Flipped Classroom

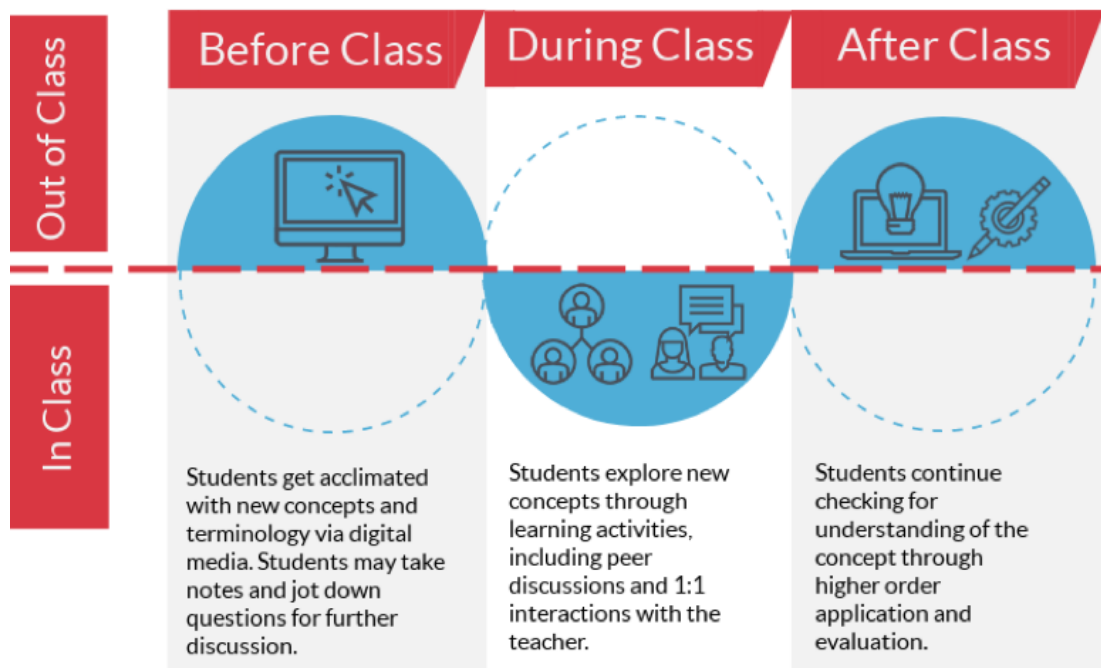


Figure 2 - The Flipped Classroom, from <https://www.odysseyware.com/blog/using-classpace-flipped-classroom>

In the flipped classroom model, students begin learning the course material at home before class, while class time is focused on solidifying understanding through active discussion and problems solving:

Before class:

- Read textbook
- Do practice problems in the Study Plan on MyLab Math
- Prepare questions for class discussion

During class:

- Group Work
 - Homework in groups on MyLab Math
 - Class Activity

After class:

- Prepare for exams
 - Complete Quiz Me in the Study Plan on MyLab Math
 - Attend instructor office hours
 - Utilize MAPEL Center tutoring
- Work on project

Bloom's Taxonomy in a Flipped Classroom

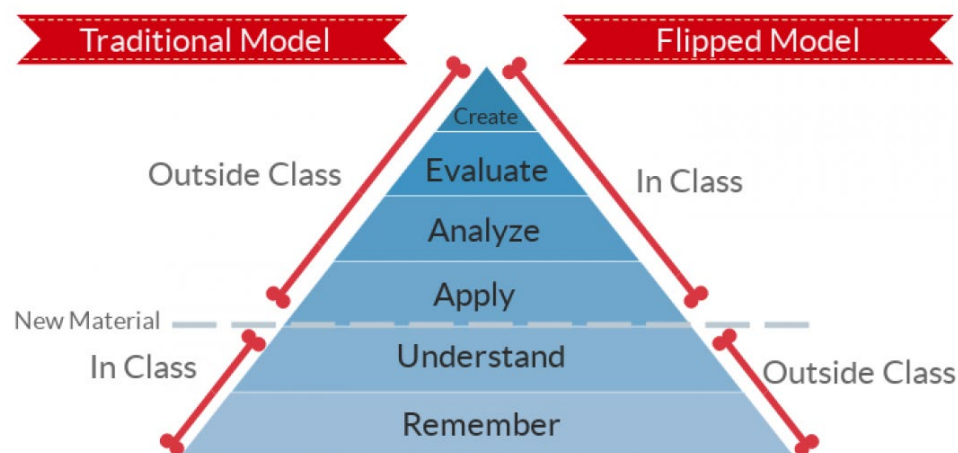


Figure 3- Bloom's Taxonomy in a Flipped Classroom, from <https://www.odysseyware.com/blog/using-classpace-flipped-classroom>

While preparing for class, students have their initial exposure to the new material through reading the textbook and lecture slides and watching lecture videos. The focus at this time is on the *Remember* and *Understand* levels of Bloom's Taxonomy:

- Memorize definitions and theorems
- Paraphrase definitions and theorems
- Understand worked examples

During class, students work with each other and the instructor to develop the *Apply*, *Analyze*, and *Evaluate* levels of Bloom's Taxonomy. Occasionally, students are expected to reach the *Create* level of Bloom's Taxonomy. After class, students should focus on consolidating their learning through additional practice.

It is essential that students put in the time and effort necessary in and out of class. It is generally recommended that for each hour of in-class time, the student spends 2-3 hours out of class studying. This class meets for 4 hours each week, therefore, ***students should expect to spend 8 – 12 hours outside class time studying for this class.***

VI. Course Requirements

A. Exams

This course will have four unit exams and a final exam:

Exam	Date	Material covered
Exam 1	Thursday 2/8	7.1 - 7.6, 2.4
Exam 2	Thursday 2/29	9.3, 9.4, 10.1, 10.3, 10.4, 11.1, 11.2
Exam 3	Thursday 4/4	12.1 - 12.4, 12.6, 13.1 - 13.3
Exam 4	Thursday 4/25	14.1 - 14.7
Final Exam	Thursday 5/9	Cumulative

Unit exams each count for 10% of the final course grade. The Final Exam counts for 20% of the final course grade.

B. Study Plan

Student must use the Quiz Me in the Study Plan on MyLab Math to demonstrate mastery of the course topics covered.

Study Plan counts for 15% of the final course grade.

C. Homework

Students will be given time to work on the homework problems in MyLab Math in class. Any unfinished problems must be completed after class, prior to the exam the material is tested on. Homework due dates:

Homework	Due Date	Exam Tested
7.1 - 7.6, 2.4	Tuesday 2/6	Exam 1 on 2/8
9.3, 9.4, 10.1, 10.3, 10.4, 11.1, 11.2	Tuesday 2/27	Exam 2 on 2/29
12.1 - 12.4, 12.6, 13.1 - 13.3	Tuesday 4/2	Exam 3 on 4/4
14.1 - 14.7	Tuesday 4/23	Exam 4 on 4/25

Homework assignments count for 15% of the final course grade.

D. Game Presentation

The student must identify a commercially available board or card game which requires the use of a mathematical concept covered in this class. The student must create a presentation aimed at introducing the game to teachers on the benefits of incorporate this game in their classroom. More details for the game presentation will be given during the semester.

E. Course Grade

The final course grade will be calculated as follows:

Category	Weight
Homework	15%
Study Plan	15%
Game Presentation	10%
Exam 1	10%
Exam 2	10%
Exam 3	10%
Exam 4	10%
Final Exam	20%
Total	100%

Final Grading Scale	
Overall Percentage	Final Grade
90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
< 60%	F

F. Late and/or Make-up Policy for Coursework

It is expected that students will complete all work by the posted due date. No late work will be accepted. Students are expected to take exams on scheduled dates. Once an exam has been given, its contents are assumed to be public knowledge. There are NO make-ups for exams.

VII. Student Code of Conduct**A. Standards of College Behavior**

Students are expected to adhere to the [Montgomery College Student Code of Conduct](https://www.montgomerycollege.edu/_documents/policies-and-procedures/42001-student-code-of-conduct.pdf) (https://www.montgomerycollege.edu/_documents/policies-and-procedures/42001-student-code-of-conduct.pdf).

B. Academic Honesty

All exams in this class are closed notes, closed book, and individual. Students should not be collaborating on any exams and any attempts to submit work that is not the student's own constitutes breaches of academic honesty and will result in appropriate sanctions. Students should refer to Section VIII Academic Dishonesty of the [Student Code of Conduct](#) or the following excerpt for more details:

https://www.montgomerycollege.edu/_documents/academics/support/learning-centers/writing-reading-learning-ctr-germantown/academic-dishonesty-and-how-it-is-handled.pdf

VIII. Collegewide Policies and Procedures**A. Attendance Policy**

Students are expected to attend all class sessions. In cases involving excessive absences from class, the instructor may drop the student from the class. An excessive absence is defined as one more absence than the number of classes per week during a fall or spring semester; the number of absences is prorated for accelerated sessions.

B. Withdrawal and Refund Dates

It is the student's responsibility to drop a course. Non-attendance of classes or failure to pay does not constitute official withdrawal.

- Refund Drop Deadline – January 29, 2024
- No Grade Drop & Audit/Credit Deadline – February 12, 2024
- W Grade Drop Deadline – April 15, 2024

C. Audit Policy

All students registered for audit are required to consult with the instructor before or during the first class session in which they are in audit status, and students are required to participate in all course activities unless otherwise agreed upon by the student and instructor at the time of consultation. Failure to consult with the instructor or to so

participate may result in the grade of “W” being awarded. This action may be taken by the instructor by changing the “AU” to “W” before the drop with “W” date.

D. Disability Support Services

Your success in this class is important to me. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. If you have a disability that may impact your access and learning in this course, please contact me to discuss your specific needs. An accommodation letter from [Disability Support Services \(DSS\)](http://www.montgomerycollege.edu/dss) (<http://www.montgomerycollege.edu/dss>) authorizing your accommodations will be needed. Please note that accommodations needed for an online course may be different from those needed in a traditional classroom setting, so it is important to work with DSS to determine appropriate accommodations for this course as early as possible. Since accommodations are not retroactive, it is strongly recommended that you notify me as early as possible in the term.

E. Veteran’s Services

If you are a veteran or on active or reserve status and you are interested in information regarding opportunities, programs and/or services, please visit the [Combat2College website](http://www.montgomerycollege.edu/combat2college) (<http://www.montgomerycollege.edu/combat2college>).

F. Delayed Opening or Closing of the College

Montgomery College will always operate on its regular schedule unless otherwise announced. Depending on the nature of the incident, notifications of emergencies and changes to the College’s operational status will be communicated through one or more of the following means:

- College emergency responders: Security Officers, Campus Response and/or Support Teams
- [Montgomery College ALERT](https://www.montgomerycollege.edu/life-at-mc/public-safety/mc-alert.html) (<https://www.montgomerycollege.edu/life-at-mc/public-safety/mc-alert.html>). Registered users receive text and e-mail messages
- Montgomery College Emergency Desktop Notification. Scrolling messages are broadcast on College computers
- [Montgomery College website](http://www.montgomerycollege.edu/) (<http://www.montgomerycollege.edu/>)
- [MyMC website](http://mymc.montgomerycollege.edu/) (<http://mymc.montgomerycollege.edu/>)
- Montgomery College [student e-mail system](http://portal.office.com/) (<http://portal.office.com/>)
- Montgomery College employee voice mail. From off-site, dial 240-567-1701
- Montgomery College [employee e-mail](http://mail.montgomerycollege.edu/) (<http://mail.montgomerycollege.edu/>)
- Montgomery College main phone number at 240-567-5000
- Montgomery College cable channel 10 in Montgomery County
- Commercial radio and TV stations including:

Television	Radio
Channel 4 WRC	WTOP (103.5 FM)
Channel 5 WTTG	WFRE (99.5 FM) - Frederick
Channel 7 WJLA	WAMU (88.5 FM)
Channel 9 WUSA	WFMD (930 AM) - Frederick
News Channel 8	WMAL (630 AM)

All inquiries from the news media regarding an emergency event should be directed to the College's Office of Communications.

How Closing and Delays Impact Classes

If a class can meet for 50% or more of its regularly scheduled meeting time OR if the class can meet for 50 minutes or more, it will meet. Montgomery College will always operate on its regular schedule unless otherwise announced. Depending on the nature of the incident, notifications of emergencies and changes to the College's operational status will be communicated through one or more communication methods including the [College's website \(http://www.montgomerycollege.edu\)](http://www.montgomerycollege.edu). For the most up-to-date information regarding College openings, closings, or emergencies, all students, faculty, and staff are encouraged to sign up for email and text alerts via [Montgomery College ALERT \(https://www.montgomerycollege.edu/life-at-mc/public-safety/mc-alert.html\)](https://www.montgomerycollege.edu/life-at-mc/public-safety/mc-alert.html). For registration information, please visit the [Montgomery College Public Safety website \(http://www.montgomerycollege.edu/emergency\)](http://www.montgomerycollege.edu/emergency).

G. Communication

This course will use your official Montgomery College email address and our course on MyLab Math for communication. It is recommended that you check your account routinely for official communication or as directed by your instructor(s). Some items you may find there are: course announcements, invoices, important admission/registration information, waitlist status. To check your e-mail, log into your MyMC account and locate the e-mail icon in the upper right hand corner of the page.

This course will NOT use Blackboard for communication.

H. Sexual Misconduct

Montgomery College's Sexual Misconduct [Policy & Procedure \(31001-CP\) \(https://www.montgomerycollege.edu/documents/policies-and-procedures/31001-sexual-misconduct.pdf\)](https://www.montgomerycollege.edu/documents/policies-and-procedures/31001-sexual-misconduct.pdf) and Federal Title IX law prohibit discrimination and harassment on the basis of sex in College programs and activities. Any student who is impacted by sexual harassment, sexual assault, dating and domestic violence, stalking, gender discrimination, pregnancy discrimination, gender-based harassment or retaliation should contact the College's Title IX Coordinator to make a report and/or access supportive measures and resources. For more detailed information about the College's response to sexual misconduct or to make a formal complaint visit the [College's Title IX webpage \(https://www.montgomerycollege.edu/policies-and-procedures/title-ix/\)](https://www.montgomerycollege.edu/policies-and-procedures/title-ix/).

I. Pregnancy

Title IX prohibits discrimination on the basis of sex, including pregnancy and related conditions. The College must give all students who might be, are, or have been pregnant the same access to school programs and educational opportunities as other students. For guidance and obligations related to academic adjustments, accommodations, and support, please see the [College's Title IX webpage \(https://www.montgomerycollege.edu/policies-and-procedures/title-ix/\)](https://www.montgomerycollege.edu/policies-and-procedures/title-ix/).

IX. Schedule

A. Class Meeting Schedule

Week	Date	Topic
1	Tue 1/23	Course introduction 7.1 Motivating and Defining Ratio and Proportional Relationships
	Thu 1/25	7.2 Solving Proportion Problems by Reasoning with Multiplication and Division 7.3 The values of a ratio: Unit Rates and Multipliers
2	Tue 1/30	7.4 Proportional Relationships 7.5 Proportional Relationships versus Inversely Proportional Relationships
	Thu 2/01	2.4 Reasoning about Percent 7.6 Percent Revisited: Percent Increase and Decrease
3	Tue 2/06	Exam 1 Review
	Thu 2/08	Exam 1 (7.1 - 7.6, 2.4)
4	Tue 2/13	9.3 Equations 9.4 Solving Algebra Word Problems with Strip Diagrams and with Algebra
	Thu 2/15	10.1 Lines and Angles 10.3 Circles and Spheres
5	Tue 2/20	10.4 Triangles, Quadrilaterals, and Other Polygons
	Thu 2/22	11.1 Concepts of Measurement 11.2 Length, Area, Volume, and Dimension
6	Tue 2/27	Exam 2 Review
	Thu 2/29	Exam 2 (9.3, 9.4, 10.1, 10.3, 10.4, 11.1, 11.2)
7	Tue 3/05	12.1 Areas of Rectangles Revisited 12.2 Moving and Additivity Principles About Area
	Thu 3/07	12.3 Areas of Triangles 12.4 Areas of Parallelograms and Other Polygons
8	<i>Spring Break</i>	
9	Tue 3/19	12.6 Area and Circumference of Circles and the Number Pi
	Thu 3/21	12.9 Using the Moving and Additivity Principles to Prove the Pythagorean Theorem
10	Tue 3/26	13.1 Polyhedra and Other Solid Shapes
	Thu 3/28	13.2 Patterns and Surface Area 13.3 Volumes of Solid Shapes
11	Tue 4/02	Exam 3 Review
	Thu 4/04	Exam 3 (12.1 - 12.4, 12.6, 13.1 - 13.3)

12	Tue 4/09	14.1 Reflections, Translations, and Rotations
	Thu 4/11	14.2 Symmetry 14.3 Congruence
13	Tue 4/16	14.4 Construction with Straightedge and Compass 14.5 Similarity
	Thu 4/18	14.6 Dilations and Similarity 14.7 Areas, Volumes, and Similarity
14	Tue 4/23	Exam 4 Review
	Thu 4/25	Exam 4 (14.1 - 14.7)
15	Tue 4/30	Project Presentations
	Thu 5/02	Final Exam Review
	Thu 5/09	Final Exam (10:15 am - 12:15 pm)

The professor reserves the right to make changes to this syllabus.

Last Updated January 23, 2024