MATHUN1003. College Algebra -Analytic Geometry. Spring 2024.

Basic info.

Instructor : Baiqing Zhu. email : bz2393@columbia.edu

Class room : 407 Mathematics Building Class times : Tu Th 6:10 pm - 7:25 pm.

Office hours and rooms : Tu Th 3:00 pm - 4:00 pm (or by appoinment) at Mathematics 528.

TA: TBD

Textbook. *Precalculus: Mathematics for Calculus*, 7$^{\text{th}}$ edition, by James Stewart, Lothar Redlin, and Saleem Watson. Please make sure that you have the right edition of the textbook!

Course overview.

- Properties of real numbers, exponents, linear and quadratic equations, coordinates.
- Functions, graphs and their properties, transforming functions.
- Polynomials, graphing polynomials, polynomial division, root finding, complex numbers, rational functions.
- Exponentials and logarithms.
- Trigonometry.
- Polar coordinates, as time permits.

Learning objectives.

Understand the basic concepts of real numbers, polynomials, functions and graphs, coordinate systems; Understand some usual functions: exponential function, trigonometric functions; Solving simple equations such as quadratic equations.

Exams and homework.

- Homework (30%) : It will be assigned every Thursday and due by next Thursday. Homeworks will be submitted via Canvas and graded on Gradescope.
- Midterm exams (30%): we have two **in-person** midterms which will take **75 minutes**. It's now (tentatively) scheduled on **Tuesday Feb** 13$^{\mathbf{rd}}$ and **Tuesday Mar** 26$^{\mathbf{th}}$ during normal class hours.
- Final exam (40%): we have **in-person** final exam which takes **2 hours**.

Course policies.

Late work. Each written assignment will have a grace period of 12 hours past their due date and a late due date. Work submitted after the grade period, but before the late due date will incur a penalty of 20% per day calculated from the end of the grade period. There will be no credit granted

to any written assignment that is not submitted past the late due date noted in the course syllabus without advance notice and permission from the instructor.

Collaborations. While you are welcome to collaborate with your peers with your homework, you must attempt all problems on your own and your submitted solutions must be written out individually. Submissions which are copied or suspiciously similar may be rejected. A substantiated violation of the code of academic integrity may result to serious academic disciplinary action.

Tentative class plan. Change due to circumstances!

Date	**Topic**
Week 1: 1/16, 1/18	1.1-1.4: Real numbers; Exponents and radicals; Algebraic and rational expressions.
Week 2: 1/23, 1/25	1.5-1.8: Equations; Complex numbers; Modeling with equations.
Week 3: 1/30, 2/1	1.9-1.12: Inequalities; The coordinate plane; Graphs; Lines; Modeling variation.
Week 4: 2/6, 2/8	2.1-2.4: Functions and its graphs; Average rate of change of a function.
Week 5: 2/13, 2/15	2.5-2.8: Linear functions; Transformations and combinations of functions.
Week 6: 2/20, 2/22	**Midterm 1** on 2/10, Chapter 1 & 2. 3.1-3.3 on 2/22: Polynomial functions and graphs.
Week 7: 2/27, 2/29	3.4-3.7: Zeros of polynomials; Rational functions.
Week 8: 3/5, 3/7	4.1-4.5: Exponential and logarithmic functions and equations.
Spring break	
Week 9: 3/19, 3/21	4.6-4.7: Modeling with exponential functions; Logarithm scales.
Week 10: 3/26, 3/28	**Midterm 2** on 3/26, Chapter 3 & 4 5.1-5.2 on 3/28: Unite circle and trigonometric functions.
Week 11: 4/2, 4/4	5.3-5.6: Graphs of trigonometric and inverse trigonometric functions.
Week 12: 4/9, 4/11	6.1-6.4: Trigonometric functions of angles.
Week 13: 4/16, 4/18	6.5-6.6, 7.1-7.2: Law of sines and cosines; Trigonometric identities.
Week 14: 4/23, 4/25	7.3-7.5: Trigonometric equations.
Week 15: Final review	**Final:** Chapter 5, 6 & 7

Letter grade scale.

Grade	Percentage
A+	98-100%
A	93-97.9%
A-	90-92.9%
B+	87-89.9%
B	83-86.9%
B-	80-82.9%
C+	77-79.9%
C	73-76.9%
C-	70-72.9%
D	60-69.9%
F	59.9% and below

University policies and resources.

Academic Integrity. Columbia University expects its students to act with honesty and propriety at all times and to respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely. It is essential to the academic integrity and vitality of this community that individuals do their own work and properly acknowledge the circumstances, ideas, sources, and assistance upon which that work is based. Academic honesty in class assignments and exams is expected of all students at all times.

Diversity Statement. It is our intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

Accessibility. Columbia is committed to providing equal access to qualified students with documented disabilities. A student's disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website: https://health.columbia.edu/content/disability-services.