BOROUGH OF MANHATTAN **COMMUNITY COLLEGE**
City University of New York

Department of Mathematics

College Algebra with Trigonometry **Class hours: 4**

MAT 157 Section 1600

Semester: Spring 2025 **Credits: 4**

Instructor Information
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Our Website: https://openlab.bmcc.cuny.edu/college-algebra-with-trigonometry-mat-157-1600-spring-2025/

Course Description
This course is a college algebra course including an introduction to trigonometry. Topics include algebra of the real numbers, algebraic and exponential functions and their graphs, systems of linear equations, inequalities and absolute values, right angle trigonometry, and an introduction to trigonometric functions.
Pre-requisites: Placement by the CUNY proficiency index or passed or been exempt from MAT 51 or MAT 12. Students who have passed MAT 56 or MAT 56.5 or MAT 206.5 or MAT 214.5 are not eligible to take this course.

Student Learning Outcomes and Assessment:

Course Student Learning Outcomes	**Measurements**
1. Students should be able to perform operations and solve equations involving algebraic and transcendental expressions in the real numbers, including polynomial, rational, radical and exponential, linear inequalities, systems of equations.	**1.** Homework, quizzes, midterm, project(s), final exam.
2. Students should be able to represent equations in the real numbers graphically, and translate between graphical and algebraic forms, and use both graphical and algebraic forms to solve problems.	**2.** Homework, quizzes, midterm, project(s), final exam.
3. Students should be able to graph, interpret and analyze quadratic and other higher order polynomial functions.	**3**. Homework, quizzes, midterm, project(s), final exam.
4. Students should be able to evaluate, graph, interpret, and analyze functions both algebraically and geometrically.	**4**. Homework, quizzes, midterm, project(s), final exam.

General Education Outcomes and Assessment:

General Education Learning Outcomes	**Measurements**
Communication Skills- Students will be able to write, read, listen and speak critically and effectively.	Homework, quizzes, online problem assignments, midterm, final exam.

Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	Homework, quizzes, online problem assignments, midterm, final exam.
Information & Technology Literacy- Students will be able to collect, evaluate and interpret information and effectively use information technologies.	Homework, quizzes, online problem assignments, midterm, final exam.

Course Requirements

1a Textbook: Abramson, Jay. College Algebra. OpenStax, 2021.

A free, peer-reviewed online textbook for College Algebra. **(CA)**

https://openstax.org/details/books/college-algebra-2e

1b Textbook: Abramson, Jay. Algebra and Trigonometry. OpenStax, 2021.

A free, peer-reviewed online textbook for Trigonometry. **(T)**

https://openstax.org/details/books/algebra-and-trigonometry-2e

You may choose to read the textbook online, or you can download it as a PDF to read offline or print out if you like.

2. Technology: A scientific calculator is required. Graphing calculators and cell phone calculators are not allowed.

Math Lab

The Math Lab is located in S535. It is dedicated to helping students improve their understanding of mathematics at any level. You will need a valid BMCC student ID to visit the Math Lab. Tutors are available in the Math Lab for free to all BMCC students. The Math Lab has worksheets with practice problems in stock, as well as computer- and video-based tutoring. Your instructor can require you to attend to tutoring in the Math Lab and can also track how often you visit it and for how long. The Math Lab is typically open any day of the week when BMCC has classes in session.
For current hours and more information about the Math Lab, see the webpage
https://www.bmcc.cuny.edu/academics/departments/math/mathematics-lab-tutoring/.

Homework: We will use **HEPLYOURMATH** for homework assignments. This is a Free-Open Source Platform!
To use **HELPYOURMATH** homework system, you need to create an account by following the instructions below:
MAT157 - 1600
Website: https://imathas.helpyourmath.com
How to register for your student account: https://youtu.be/w-YZlcPD4qk
Course ID: 979
Enrollment Key: 1600
How to use the system: https://youtu.be/m1snAfg95vo
How to reset password: https://youtu.be/LrwD4wZzxmQ

Final Grade computation

Homework (Helpyourmath):	30%
DESMOS Activities:	10%
Special Assignments	20%
Midterm Exam	20%
Final Exam	20%

Your Final Grade will be based on:

https://www.bmcc.cuny.edu/academics/policies/grading-policies/grading-system/

Suggested Schedule and Outline of Topics:

CA: College Algebra Textbook T: Trigonometry Textbook

Week Number	Topics	Chapter and Page Number/ Book		Topic Details
Week 1	Introduction to course, real numbers and properties of exponents and radicals	1.1(CA) 1.2(CA) 1.3(CA)	Pg. 2 – 14 Pg. 17 – 28 Pg. 31 – 38	Properties of real numbers, exponents, rational exponents and simplifying radicals.
Week 2	Operations on polynomials, factoring	1.4(CA) 1.5(CA) 5.4(CA)	Pg. 41 – 47 Pg. 49 - 55 Pg. 393 – 399	Add, subtract, multiply, divide polynomials. Factor all types of polynomials.
Week 3	Rational expressions	1.6(CA)	Pg. 58 – 63	Simplify, add and subtract rational expressions. Simplify complex rational expressions
Week 4	Complex numbers and linear equations	2.4(CA) 2.2(CA)	Pg. 131 – 140 Pg. 87 – 92	Definition of complex numbers and operations on complex numbers, solve linear equations.
Week 5	Solving quadratic and other types of equations	2.5(CA) 2.6(CA)	Pg. 119 – 128 Pg. 131 - 140	Solve quadratic equations (with real and complex roots) by factoring, quadratic formula, square root method, completing the square, quadratic form.
Week 6	Solving other types of equations and inequalities in one variable	2.6(CA) 2.7(CA)	Pg. 131 – 140 Pg. 142 - 148	Solve other equations: radical, absolute value, rational and polynomial of higher degree, linear and absolute value inequalities, graph solution sets, use interval notation.
Week 7	Introduction to the rectangular coordinate system.	2.1(CA) 4.1(CA)	Pg. 74 – 80 Pg. 280 – 303	Graph linear equations, find intercepts, slopes; find the equation of a line given certain conditions, parallel and perpendicular lines; applications of linear equations.
Week 8	**MIDTERM REVIEW AND MIDTERM**			
Week 9	Solving systems of linear equations in two variables and applications	7.1(CA)	Pg. 576 – 588	Graph systems of linear equations, solve systems of linear equations using substitution and elimination methods, applications of systems of linear equations.
Week 10	Introduction to functions	3.1(CA) 3.2(CA)	Pg. 160 – 175 Pg. 180 – 192	Definition of a function, domain and range, function notation, evaluate functions, represent functions both algebraically and graphically.

Week 11	Graphs of quadratics and exponential functions	5.1(CA) 6.1(CA) 6.2(CA)	Pg. 344 – 356 Pg. 464 – 475 Pg. 479 – 485	Express and graph quadratics in standard form, convert between standard and general forms, and applications. Define exponential functions, evaluate and graph exponential functions.
Week 12	Solve exponential equations, introduction to angles	6.6(CA) 7.1(T)	Pg. 527 – 528 Pg. 681 – 704	Solve exponential equations using one-to-one property. Define angles, sketch angles in standard position, convert between degrees and radians, find coterminal angles.
Week 13	Right Triangle Trigonometry	7.2 (T)	Pg. 704 - 717	Use right triangles to evaluate trigonometric functions, use the definition of trigonometric functions of any angle, solve right-triangle trigonometry applications.
Week 14	Defining trigonometric functions using the unit circle	7.3 (T) 7.4 (T)	Pg. 717 – 736 Pg. 736 – 750	Find exact function values for all trigonometric functions for 30°,45°,60° and equivalent radian form. Find reference angles, use reference angles to find exact values of trigonometric functions. Evaluate trigonometric functions with a calculator.
Week 15	Final Exam Review, **Final Exam**			

Optional topic*

Class Participation

Participation in the academic activity of each course is a significant component of the learning process and plays a major role in determining overall student academic achievement. Academic activities may include, but are not limited to, attending class, submitting assignments, engaging in in-class or online activities, taking exams, and/or participating in group work. Each instructor has the right to establish their own class participation policy, and it is each student's responsibility to be familiar with and follow the participation policies for each course.

BMCC Policy on Plagiarism and Academic Integrity Statement

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited

work. The full policy can be found on BMCC's Web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).

Gender-Inclusivity
BMCC community members have the right to use and be referred to according to their preferred name, title, and/or personal pronouns. Everyone also has the right to use all spaces according to their self-identification, including restrooms and locker rooms. To learn more about how to change your preferred name and affirm your gender identity at CUNY (including requesting a new ID card and/or email address), go here: https://www.bmcc.cuny.edu/student-affairs/lgbtq/

Anyone who has experienced harassment related to gender or sexual identification, who needs assistance, or who wishes to file a complaint, can contact the Office of Compliance and Diversity: https://www.bmcc.cuny.edu/about-bmcc/compliance-diversity/.

FREE BMCC STUDENT SUPPORT SERVICES

BMCC is committed to the health and well-being of all students. It is common for everyone to seek assistance at some point in their life, and there are free and confidential services on campus that can help.

Advocacy and Resource Center (ARC) https://www.bmcc.cuny.edu/student-affairs/arc/ room S230, 212-220-8195, arc@bmcc.cuny.edu. If you are having problems with food or housing insecurity, finances, health insurance or anything else that might get in the way of your studies at BMCC, contact the Advocacy and Resource Center (formerly Single Stop) for assistance. Please contact us at arc@bmcc.cuny.edu, call 212-220- 8195, or come by the office at room S230. You may also contact the Office of Student Affairs, S350, 212-220-8130, studentaffairs@bmcc.cuny.edu, for assistance.

Counseling Center www.bmcc.cuny.edu/counseling, room S343, 212-220-8140, counselingcenter@bmcc.cuny.edu. Counselors assist students in addressing psychological and adjustment issues (i.e., depression, anxiety, and relationships) and can help with stress, time management and more. Counselors are available for walk-in visits.

Office of Compliance and Diversity https://www.bmcc.cuny.edu/about-bmcc/compliance-diversity, room S701, 212-220-1236. BMCC is committed to promoting a diverse and inclusive learning environment free of unlawful discrimination/harassment, including sexual harassment, where all students are treated fairly. For information about BMCC's policies and resources, or to request additional assistance in this area, please visit or call the office, or email olevy@bmcc.cuny.edu, or twade@bmcc.cuny.edu. If you need immediate assistance, please contact BMCC Public safety at 212-220-8080.

Office of Accessibility www.bmcc.cuny.edu/accessibility, Students who need academic accommodations in connection with a disability must initiate the request with BMCC's Office of Accessibility (OA). Students need to register with the Office of Accessibility in order to officially disclose their disability status to the College and to determine eligibility for appropriate reasonable accommodations (including any prior IEPs or 504s). Please contact the OA at the start of the semester (or as soon as possible) to coordinate any accommodation request/s: www.bmcc.cuny.edu/accessibility, Room N360 (accessible entrance: 77 Harrison Street), 212-220-8180, accessibility@bmcc.cuny.edu.