BOROUGH OF MANHATTAN COMMUNITY COLLEGE

City University of New York

**Department of Mathematics**

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| **Elementary Algebra** | **Class hours: 4** |
| **MAT 51** |  |
| **Semester:** | **Instructor Information:**  **Name:**  **Email:**  **Phone:**  **Office:** |
| **Credits: 0** |

**Course Description:**

This course is the lowest level algebra course offered at the college. It includes topics such as arithmetic with integers, algebraic representation, operations with polynomials, solving linear equations, solving systems of two linear equations in two variables, exponents and radicals, factoring and graphing linear equations.

**Pre/Co-Requisites:**

Pre-Requisite: ESL 062. Students who score less than 40 on the COMPASS algebra exam are eligible to take MAT 51. Students must also have pre-algebra COMPASS score of at least 35 or have successfully completed MAT 8.

**Student Learning Outcomes and Assessment:**

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| **Course Student Learning Outcomes** | **Measurements** |
| **1) Operations**  a. Radicals. Includes only square roots of nonnegative *numbers*.  *i.* Simplify radical terms (no variable in the radicand).  *ii.* Perform addition, subtraction, multiplication and division using like and unlike radical terms and express the result in simplest form.  b. Scientific Notation  *i.* Convert between standard decimal and scientific notation.  *ii.* Understand and use scientific notation to compute sums and differences of numbers.  c. Exponents.  Multiply and divide monomial expressions with a common base using the properties of exponents. All exponents are integral. | Homework, quizzes,  online  problem assignments, midterm,  final exam, **MATH** **CUNY-Wide EXAM** |
| **2) Variables and Expressions**  a. Translate a quantitative verbal phrase into an algebraic expression.  b. Add and subtract monomials and polynomials.  c. Substitute and evaluate numbers in for algebraic expressions.  d. Multiplication of a monomial and binomial by any degree polynomial.  e. Divide a polynomial by a monomial, where the quotient has no remainder.  f. Factoring  *i.* Identify and factor the greatest common factor from an algebraic expression.  *ii.* Identify and factor the difference of two perfect squares.  *iii.* Factor all trinomials of a single variable, including a leading coefficient other than 1.  *iv.* Factor algebraic expressions by grouping with up to 4 terms  *v.* Factor algebraic expressions completely where the factorization requires more than one step |
| **3) Equations and Inequalities**  a. Translate verbal sentences into mathematical equations.  b. Solve all types of linear equations in one variable.  c. Systems of Linear Equations (2x2)  *i.* Solve systems of two linear equations in two variables algebraically.  *ii.* Graph and solve systems of linear equations with rational coefficients in two variables.  d. Solve literal equations for a given variable.  e. Quadratic Equations:  *i.* Understand and apply the multiplication property of zero to solve quadratic equations with integral coefficients.  *ii.* Solve quadratic equations with no linear term.  *iii.* Determine the measure of a third side of a right triangle using the Pythagorean Theorem, given the lengths of any two sides.  f. Linear inequalities in a single variable  *i.* Solve linear inequalities in one variable.  *ii.* Represent solutions to linear inequalities as a single inequality.  *iii.* Represent the solution to a linear inequality in one variable on a number line. |
| **4) Coordinate Geometry**  a. Slope and equations of a line  *i.* Determine the slope of a line, given the coordinates of two points on the line.  *ii.* Determine the slope of a line, given the line’s graph  *iii.* Write the equation of a line, given its slope and the coordinates of a point on the line.  *iv.* Write the equation of a line, given the coordinates of two points on the line.  *v.* Write the equation of a line parallel to the *x* – or *y*-axis.  *vi.* Determine the slope of a line, given its equation in any form.  *vii.* Write and transform equations of lines in the following forms   1. Point-Slope form 2. Slope Intercept form 3. *Ax + By = C* form   b. Draw and recognize graphs of lines. |
| **5) Proportions and percent**  a. Solve simple verbal problem with two quantities that are proportional.  b. Solve simple verbal problem involving a single percent and/or a single percent increase/decrease. |

**General Education Outcomes and Assessment:**

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| **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, **MATH** **CUNY-Wide 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, **MATH** **CUNY-Wide 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, **MATH** **CUNY-Wide EXAM** |

**Required Text, WebAssign access code, and Readings (One of the four options\* is required.)**

* 1. eBook with *WebAssign access code (for* life-of-edition (LOE) of the textbook)

**ISBN#-13: 9781285857732** ($55.00)

* 1. Loose-leaf (not bound)Custom *Elementary Algebra*, 9*th edition* textbook **AND** eBook format with *WebAssign access code(for* life-of-edition [LOE] of the text book) (Bundle)

**ISBN#-13: 9781133851707 ($109.00)**

* 1. Soft-cover (bound) Custom *Elementary Algebra*, 9*th edition* textbook **AND** eBook format with *WebAssign access code(for* life-of-edition [LOE] of the text book) (Bundle)

**ISBN#-13: 9781133305354 ($111.00)**

* 1. Charles Mckeague, *Elementary Algebra*, 9*th edition, (not bundled with WebAssign)*

**ISBN#-13: 9780840064219 ($213.00) -** other price options to rent text and/or ebook are offered on microsite

**\*NOTE: For the reduced prices above, options 1-4 are available only through the online Cengage BMCC microsite:** <http://www.cengagebrain.com/micro/bmccmat>.

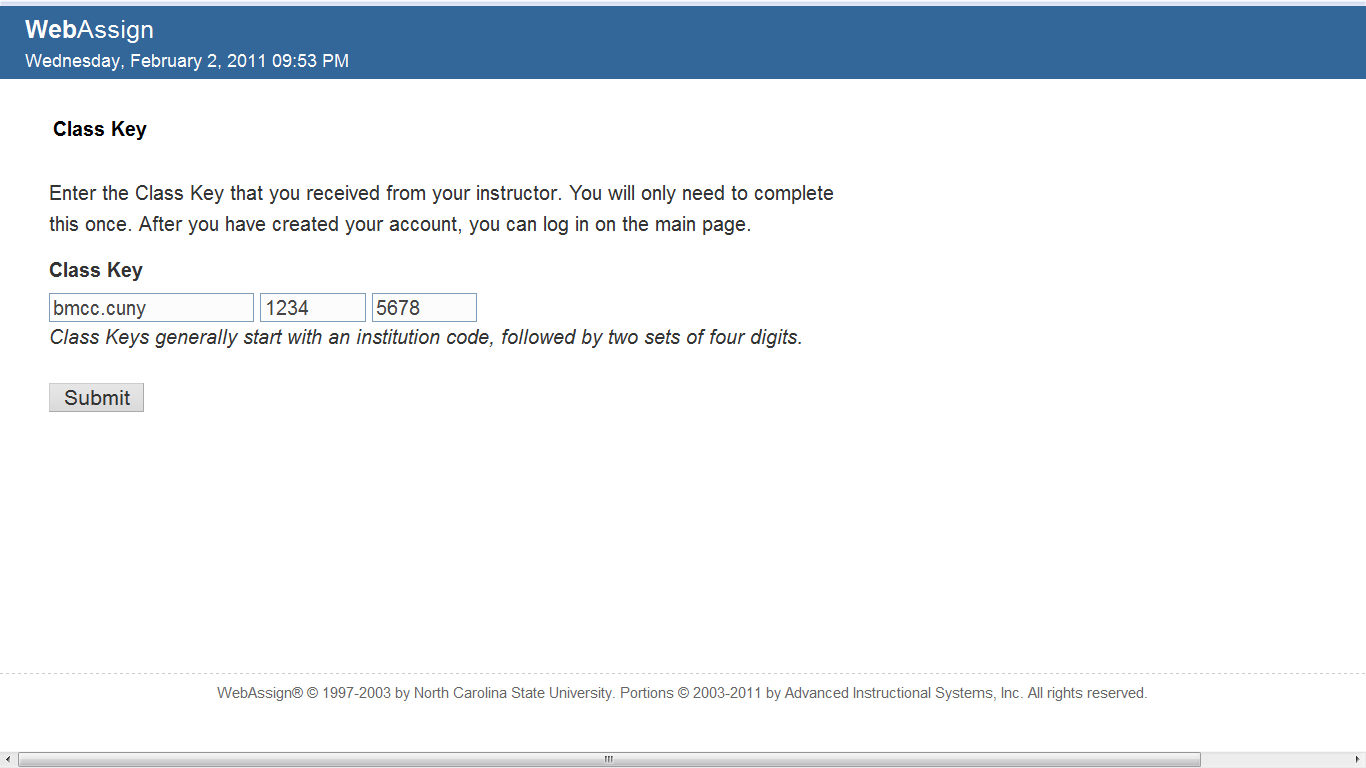
**For a higher price, options 1 and 3 can be purchased at the college bookstore.**

**Math Lab Use:** The Math Lab is located in S535. 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.

**Use of Technology:** All students are required to use the **WebAssign** online courseware system. It contains videos, homework problems, chapter tests and quizzes, step-by-step help, an online version of the textbook, and more. Students can access the online courseware only by buying a **new textbook** that contains a student access card or by buying a **separate access code** from the bookstore or the publisher (at [www.webassign.net](http://www.webassign.net)).

**Steps to register for WebAssign:**

1. Have your access code card ready.
2. Make sure to get the **Class Key** for your course from your instructor.
3. Go to <https://www.webassign.net/v4cgi/selfenroll/classkey.html>
4. Enter the Class Key and then click submit. The screen looks like this



This is only an example. **Make sure you use the Class Key given to you by your instructor.**

1. On the next page, verify the course, section and instructor by choosing “Yes, this is my class,”
2. After verifying your class’ information, you will see two options:

* “I need to create a WebAssign account.”
* “I already have a WebAssign account.”

**If you choose “I need to create a WebAssign account,” move to step 7.**

If you choose “I already have a WebAssign account” then sign in (**institution: bmcc.cuny**).

If you don’t remember your password then open a new tab or window and go to https://www.webassign.net/login.html?password=forgot to recover it.

1. Create your own password and username. **It can be any username and password that you want.** Enter the email address you use regularly (it does not have to be your BMCC email address). Write this username and password in a safe place.

**Username: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Password: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**From now on, log in by going to** [www.webassign.net](http://www.webassign.net) **. In the ACCOUNT LOG IN section, enter your username, the institution (bmcc.cuny) and password.**

1. After logging in you may see a notice that includes Grace Period information and payment options. You can **“register a code number if you have an Access Code card”** or **“you can buy an Access Code online via a credit card, debit card or Pay Pal account”**. After the Grace Period you will see the payment options and not be able to continue without entering an Access Code.

**Evaluation and Requirements of Students:**

The final grade in this course will be a passing grade of S, or a failing grade of R.   (See complete grade distribution below). A passing grade for the Midterm Exam is **70% or higher**. A passing grade for the Departmental Final Exam is **70% or higher**. A passing grade for the CUNY EXAM is **60% or higher**.

**To pass the course, students must have an overall course average of 70% or higher.**

If a score on the Midterm Exam is below 70%, the student is required to complete the online WebAssign Intervention Assignments with a score of 70% or higher on each assignment.

A student who passes the Departmental Midterm Exam with a 70% or higher is exempt from completing the Intervention Assignment requirement, but is strongly encouraged to do those assignments for extra practice. Our research has shown that many more students who do the Intervention Assignments pass the Departmental Final Exam than those who do not. Thus, it is a good idea for all students to do the Intervention Assignments, even if they have passed the Midterm Exam. These assignments are an excellent way to prepare for the Departmental Midterm and Final Exams.

**Grade Distribution:**

***REQUIRED***

**Midterm: 20%**

**Departmental Final: 20%**

**CUNY EXAM (CEAFE): 35%**

**Homework and Quizzes: 25%**

**College Attendance Policy:**

#### 1. Absences

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For this course, you are allowed five hours of absence (not five days). In the case of excessive absence, the instructor has the option of assigning a “WU” or “R” grade.

**2. Class Attendance**

* Attendance in both regular and remedial courses is mandated by policy of the City University of New York.
* Once classes begin, you must officially drop or withdraw from a course that you no longer want to attend before the deadlines (check the [Academic Calendar](http://www.bmcc.cuny.edu/calendar/academic_calendar.jsp) for specific dates). \*

**\*Please Note:** If you do not take action on the course, you will receive a grade of "WU or WN" (based on attendance). If the Office of the Registrar assigns a WN (which means you never attended the class during the first week of classes), you are still 100% liable for the tuition. However, if you stop attending at any time during the term then you should receive a grade of WU (Withdrew Unofficially-same as an "F" grade) which counts as a failure in your GPA and may have financial repercussions.

**3. Lateness**

Classes begin promptly at the times indicated in the Schedule of Classes. Arrival in classes after the scheduled starting time constitutes a lateness. Latecomers may, at the discretion of the instructor, incur an official absence.

**Academic Adjustments for Students with Disabilities:**

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Accessibility. BMCC is committed to providing equal access to all programs and curricula to all students.

**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](http://www.bmcc.cuny.edu). For further information on integrity and behavior, please consult the college bulletin (also available online).

**Suggested Schedule:**

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| Week 1 | Chapter 1 The Basics   * 1. Variables, Notation, and Symbols   2. Real Numbers   3. Addition and Subtraction of Real Numbers   4. Multiplication of Real Numbers   5. Division of Real Numbers |
| Week 2 | * 1. Properties of Real Numbers   2. Subsets of Real Numbers   1.8 Addition and Subtraction of Fractions with Variables  Chapter 2 Linear Equations and Inequalities  2.1 Simplifying Expressions  2.2 Addition Property of Equality |
| Week 3 | 2.3 Multiplication Property of Equality  2.4 Solving Linear Equations  2.5 Formulas  2.6 Applications |
| Week 4 | 2.7 More Applications  2.8 Linear Inequalities  Chapter 3 Linear Equations and Inequalities in Two Variables  3.1 Paired Data and Graphing Ordered Pairs  3.2 Solutions to Linear Equations in Two Variables |
| Week 5 | 3.3 Graphing Linear Equations in Two Variables  3.4 More on Graphing: Intercepts  3.5 The Slope of a Line  3.6 Finding the Equation of a Line |
| Week 6 | Chapter 4 Systems of Linear Equations  4.1 Solving Linear Equations by Graphing  4.2 The Elimination Method  4.3 The Substitution Method  4.4 Applications |
| Week 7 | Review for Midterm Exam  **Departmental Midterm Exam:**  Signed Numbers, Algebraic Expressions and Exponents, Solving and Graphing Linear Equations/Inequalities, Systems of Linear Equations |
| Week 8 | Chapter 5 Exponents and Polynomials  5.1 Multiplication with Exponents  5.2 Division with Exponents  5.3 Operations with Monomials  5.4 Addition and Subtraction of Polynomials |
| Week 9 | 5.5 Multiplication with Polynomials  5.6 Binomial Squares and Other Special Products  5.7 Dividing a Polynomial by a Monomial  Chapter 6 Factoring  6.1 The GCF and Factoring by Grouping |
| Week 10 | 6.2 Factoring Trinomials  6.3 More Trinomials to Factor  6.4 The Difference of Two Squares |
| Week 11 | 6.6 Factoring: A General Review  6.7 Solving Equations by Factoring  7.1 Simplifying Rational Expressions  Chapter 8 Square Roots  8.1 Definitions and Common Roots |
| Week 12 | 8.2 Properties of Radicals  8.3,8.4 Operations with Radicals  **Pythagorean Theorem(Supplemental**  **Material)** |
| Week 13 | Review for Final Exam |
| Week 14 | **Department Final Exam**  Review for the **MATH** **CUNY-Wide EXAM** |
| Week 15 | **MATH** **CUNY-Wide EXAM** |