Intermediate Algebra and Trigonometry  
MAT 56  
Semester:  
Credits: 0  

Class hours: 6

Instructor Information

Name:
Email:
Phone:
Office:

Course Description
This course is an intermediate algebra and trigonometry course. It includes such topics as properties of real numbers, polynomials and factoring, equations in one and two variables, inequalities, systems of linear equations, rational expressions, rational exponents and roots, quadratic functions, exponential and logarithmic functions, and an introduction to trigonometry.

Pre-requisites
MAT 12 or MAT 51 or the equivalent.

Student Learning Outcomes and Assessment:

<table>
<thead>
<tr>
<th>Course Student Learning Outcomes</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students should be able to solve applied word problems, including correctly setting up problems and translating between words and algebraic expressions and equations.</td>
<td>1. Homework, quizzes, online problem assignments, midterm, final exam.</td>
</tr>
<tr>
<td>2. Students should be able to perform operations and solve equations involving algebraic and transcendental expressions in the real numbers, including polynomial, rational, radical, exponential, logarithmic and trigonometric expressions and equations, linear inequalities, systems of equations.</td>
<td>2. Homework, quizzes, online problem assignments, midterm, final exam.</td>
</tr>
<tr>
<td>3. 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.</td>
<td>3. Homework, quizzes, online problem assignments, midterm, final exam.</td>
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</tbody>
</table>

General Education Outcomes and Assessment:

<table>
<thead>
<tr>
<th>General Education Learning Outcomes</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Skills- Students will be able to write, read, listen and speak critically and effectively.</td>
<td>Homework, quizzes, online problem assignments, midterm, final exam.</td>
</tr>
<tr>
<td>Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.</td>
<td>Homework, quizzes, online problem assignments, midterm, final exam.</td>
</tr>
<tr>
<td>Information &amp; Technology Literacy- Students will be able to collect, evaluate and interpret information and effectively use information technologies.</td>
<td>Homework, quizzes, online problem assignments, midterm, final exam.</td>
</tr>
</tbody>
</table>
Course Requirements
Your instructor will select one of the two textbooks below.
ASK YOUR INSTRUCTOR BEFORE YOU PURCHASE A TEXTBOOK.

1a. **Textbook**: Charles McKeague, *Algebra with Trigonometry for College Students*, 5th edition. Cengage, 2002* or in e-book form* (Note: For access to the e-book, you must obtain a **class key** from your instructor)

*For a reduced price, purchase the following through the online Cengage BMCC microsite.*

Copy the following URL exactly:  [http://cengagebrain.com/micro/2010436MC](http://cengagebrain.com/micro/2010436MC)


OR


- e-book (includes MyOpenMath access, and videos)……………………………………………………………………………FREE LINK:  [https://math56oer.wordpress.com/](https://math56oer.wordpress.com/)

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/](https://www.bmcc.cuny.edu/academics/departments/math/mathematics-lab-tutoring/).

Additional Resources
Practice departmental final exams can be found in the math lab (Room S535) and at [https://www.bmcc.cuny.edu/academics/departments/math/instructional-materials/](https://www.bmcc.cuny.edu/academics/departments/math/instructional-materials/)

Evaluation and Requirements of Students
- At the beginning of the semester, the instructor will advise the student of the determination of the final grade, which will include a mandatory final examination worth at least 30% of the final grade and any other criteria specified by the instructor. The other criteria can include, but is not limited to, class work, examinations, quizzes, and projects.
- A **70% or higher** overall course average is a passing course average.
- The final grade in this course will be R(repeat), S(satisfactory), W(official withdrawal), or WU(unofficial withdrawal).

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.

**Single Stop** [www.bmcc.cuny.edu/singlestop](http://www.bmcc.cuny.edu/singlestop), room S230, 212-220-8195. 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, come by the Single Stop Office for advice and assistance. Assistance is also available through the

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Office of Student Affairs, S350, 212-220-8130.

Counseling Center [www.bmcc.cuny.edu/counseling](http://www.bmcc.cuny.edu/counseling), room S343, 212-220-8140. 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 [www.bmcc.cuny.edu/aac](http://www.bmcc.cuny.edu/aac), 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](http://www.bmcc.cuny.edu/accessibility), room N360 (accessible entrance: 77 Harrison Street), 212-220-8180. This office collaborates with students who have documented disabilities, to coordinate support services, reasonable accommodations, and programs that enable equal access to education and college life. To request an accommodation due to a documented disability, please visit or call the office.

College Attendance Policy

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 example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

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).

Updated 7/9/19
### Suggested Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Sections in McKeague</th>
<th>Sections in Hirsch, Milman &amp; Offenholley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Basic Properties and Definitions</td>
<td>Linear Equations, Inequalities, Literal Equations</td>
</tr>
<tr>
<td>Week 2</td>
<td>Basic Properties and Definitions</td>
<td>Absolute Value Equations and Inequalities, Applications</td>
</tr>
<tr>
<td>Week 3</td>
<td>Equations and Inequalities in One Variable</td>
<td>Graphing Lines, Slope, Equations of Lines</td>
</tr>
<tr>
<td>Week 4</td>
<td>Equations and Inequalities in Two Variables</td>
<td>System of Linear Equations, Applications</td>
</tr>
<tr>
<td>Week 5</td>
<td>Systems of Linear Equations, Rational Expressions and Rational Functions</td>
<td>Properties of Exponents (integer and rational), Functions, Exponential Growth, Exponential and Logarithmic Functions</td>
</tr>
<tr>
<td>Week 6</td>
<td>Rational Expressions and Rational Functions (cont.)</td>
<td>Operating on Polynomials</td>
</tr>
<tr>
<td>Week 7</td>
<td>Rational Expressions and Rational Functions (cont.), Rational Exponents and Roots</td>
<td>Operating on Radicals and Complex Numbers</td>
</tr>
<tr>
<td>Week 8</td>
<td>Rational Exponents and Roots (cont.)</td>
<td>Inverse Functions and Logarithms, Properties of Logarithms</td>
</tr>
<tr>
<td>Week 9</td>
<td>Rational Exponents and Roots (cont.) Quadratic Functions</td>
<td>Quadratic Equations and Factoring</td>
</tr>
<tr>
<td>Week 10</td>
<td>Quadratic Functions (cont.) Exponential and Logarithmic Functions</td>
<td>Factoring and Rational Expressions</td>
</tr>
<tr>
<td>Week 11</td>
<td>Exponential and Logarithmic Functions (cont.)</td>
<td>Rational Expressions and Solving Radical Equations</td>
</tr>
<tr>
<td>Week 12</td>
<td>Introduction to Trigonometry</td>
<td>Introduction to Trigonometry</td>
</tr>
<tr>
<td>Week 13</td>
<td>Introduction to Trigonometry (cont.), Trigonometric Identities</td>
<td>Trigonometry</td>
</tr>
<tr>
<td>Week 14</td>
<td>Trigonometric Identities (cont.), Triangles</td>
<td>Trigonometry of Triangles</td>
</tr>
<tr>
<td>Week 15</td>
<td>Final Exam Review, <strong>Final Exam</strong></td>
<td>Final Exam Review, <strong>Final Exam</strong></td>
</tr>
</tbody>
</table>

### Outline of Topics

#### McKeague

**Chapter R** - Basic Properties and Definitions
- Exponents and Scientific Notation
- Polynomials, Sums, Differences and Products
- Factoring
- Special Factoring

**Chapter 1** - Equations and Inequalities in One Variable
- Linear and Quadratic Equations in One Variable
- Formulas
- Applications
- Linear Inequalities in One Variable
- Equations with Absolute Value

#### Hirsch, Milman & Offenholley

**Chapter 1** - Solving Equations
- Linear and Literal
- Absolute Value
- Inequalities & Interval notation
- Absolute Value Inequalities
- Applications

**Chapter 2** - Linear Equations in Two Variables
- Graphing points and lines
- Slope
- Equation of a Line
- Applications of Linear Equations

Updated 7/9/19
Inequalities with Absolute Value

Chapter 2 - Equations and Inequalities in Two Variables
- Paired Data, the Rectangular Coordinate System 178
- The Slope of a Line 192
- The Equation of a Line 202

Chapter 3 - Systems of Linear Equations and Inequalities
- Systems of Linear Equations in Two Variables 276
- Applications 312

Chapter 4 - Rational Expressions and Rational Functions
- Basic Properties and Reducing to lowest terms 347
- Division of Polynomials 360
- Multiplication and Division of Rational Expressions 371
- Addition and Subtraction of Rational Expressions 380
- Complex Fractions 389
- Equations Involving Rational Expressions 394
- Applications 405

Chapter 5 - Rational Exponents and Roots
- Rational Exponents 426
- More Expressions Involving Rational Exponents 438
- Simplified Form for Radicals 445
- Addition and Subtraction of Radical Expressions 457
- Multiplication and Division of Radical Expressions 461
- Equations with Radicals 468
- Complex Numbers 478

Chapter 6 - Quadratic Functions
- Completing the Square 493
- The Quadratic Formula 505

Chapter 7 - Exponential and Logarithmic Functions
- Exponential Functions 567
- The Inverse of a Function* 578
- Logarithms Are Exponents 588
- Properties of Logarithms 597

Chapter 10 - Introductions to Trigonometry
- Degrees, Radians, and Special Triangles 714
- Trigonometric Functions 724
- Trigonometric Functions and Calculators 731

Chapter 11 - Trigonometric Identities and Equations
- Introduction to Identities 796

Chapter 12 - Triangles
- Right Triangle Trigonometry 838
- The Law of Sines 851
- The Law of Cosines 862

Systems of Linear Equations 2.5

Chapter 3 - Exponents, Radicals, Functions
- Properties of Exponents and Functions 3.1
- Rational Exponents 3.2
- Compound Interest, Exponential Growth* 3.3

Chapter 4 - Polynomials and Radicals
- Operations on Polynomials 4.1
- Operations on Radicals 4.2
- Complex Numbers and their Operations 4.3

Chapter 5 - Inverse Functions and Logarithms
- Inverse Functions* 5.1
- Logarithms 5.2
- Properties of Logarithms 5.3
- Solving Logarithmic Equations* 5.4

Chapter 6 - Solving Equations
- Solving equations by Factoring 6.1
- Quadratic Formula and Completing the square 6.2
- More forms of Factoring 6.3

Chapter 7 - Rational Expressions and Radicals
- Simplifying Rational Expressions 7.1
- Adding and Subtracting Rational Expressions and Complex Rational Expressions 7.2
- Solving Rational Equations 7.3
- Solving Radical Equations 7.4

Chapter 8 - Trigonometry
- Right Triangle Trigonometry 8.1
- Degrees, Radians and Reference Angles 8.2
- Trigonometric Identities, Laws of sines and cosines 8.3

*Optional topic