

## MAT205 College Algebra

### Syllabus Overview

This syllabus contains all relevant information about the course: its objectives and outcomes, the grading criteria, the texts and other materials of instruction, and weekly topics, outcomes, assignments, and due dates. Consider this your roadmap for the course. Please read through the syllabus carefully and ask questions if you would like anything clarified. Please print a copy of this syllabus for reference.

### Course Description

3 Credits

Prerequisite: Math Placement Exam; Fundamentals of Math; Permission of the College

This course focuses on algebraic concepts essential for success in the workplace and other courses. Using real-world examples and applications, students practice fundamental operations with number systems, formulas, algebraic expressions, and linear equations. This course also explores problems involving factoring, inequalities, exponents, radicals, linear equations, functions, quadratic equations, and graphs.

### Course Outcomes

At the completion of this course, students should be able to:

- Apply fundamental algebraic operations (addition, subtraction, multiplication and division) to real numbers, radicals and polynomials.
- Solve linear, quadratic, radical, absolute value, exponential and logarithmic equations.
- Solve linear and absolute value inequalities.
- Graph and analyze a variety of functions including linear, quadratic, cubic, radical, absolute value, exponential and logarithmic.
- Apply the laws of exponential and logarithmic functions to solve problems.
- Solve systems of equations in 2 and 3 variables.
- Analyze and generate numeric, analytic and graphic models for conic sections.
- Use arithmetic, geometric and other sequences/series to represent patterns.
- Model data using algebraic and graphical methods.
- Utilize a variety of algebraic tools and concepts to solve real-world problems.
- Apply a variety of problem solving, critical thinking and analytical skills to mathematics.
- Research, discuss and write about real-world mathematical problems.

## Communication with Your Instructor

You will receive a welcome email from your instructor prior to the start of class. This email will contain your instructor's contact information. Your instructor will also be communicating with you via several methods in the course, including:

- **Announcements** – This communication tool, located on the navigation menu within your course in Canvas, contains important updates. Be sure to check for new announcements from your instructor each time you access your course.
- **Q&A** – Use this discussion board, located on the Home screen in your course, to communicate with your instructor and classmates regarding general course questions (i.e. missing links, assignment clarification, etc.).
- **Inbox** – Use the Inbox, located in the top right corner of Canvas, to send a message to your instructor or classmates.

## Materials and Resources

Required or Supplemental Text or Resources:

- Lial, M. L., Hornsby, J., Schneider, D. I., & Daniels, C. J. (2012). College algebra (11th ed.). Pearson Education Publishing.
  - ISBN-13: 978-0-321-67179-0
  - ISBN-10: 0-321-67191-1
- My MyMathLab Access Code. This is bundled with your textbook package. It contains the access code needed to register and access MyMathLab. Read the MyMathLab Information in the Getting Started area of our course website.

***\* There is important information in our course website about obtaining immediate, instant temporary access to MyMathLab and the eTextbook if you have not received your course materials yet.***

## Bookstore Information

The bookstore can be located in the left-hand navigation of any Canvas course.

## Library Services

Detailed information about the eLibrary can be found in the Student Resource Center. This is a course that all students have access to during their academic career.

## Canvas Help Desk and Technical Questions

If you experience technical issues in your course, please contact the Canvas Help Desk by clicking the Help link (top right corner within Canvas). There are 3 ways to contact them:

- Phone (888-628-2749)
- Live chat

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- Report a problem (submit a ticket)

Be sure to notify your instructor of any technical difficulties you are experiencing.

Additional resources are available in the Student Resource Center and the Canvas Guides website:

<https://community.canvaslms.com/docs/DOC-4121>

## Weekly Schedule

<b>Week 1</b>		<b>Review of Basic Concepts</b>
Outcomes		Define the properties of real numbers Perform fundamental arithmetic and algebraic operations Identify the characteristics of polynomials, rational expressions and exponents Apply the concepts, methods and tools of basic concepts to real-world problems
Readings		<ul style="list-style-type: none"> <li>• R.2 Real Numbers and Their Properties</li> <li>• R.3 Polynomials</li> <li>• R.4 Factoring Polynomials</li> <li>• R.5 Rational Expressions</li> <li>• R.6 Rational Exponents</li> <li>• R.7 Radical Expressions</li> <li>• MyMathLab Access Information (materials located within the course)</li> </ul>
Lectures		Review of Basic Concepts (MyMathLab Support Videos)
Discussion		<b>True Confessions</b>
Assignments		<b>MyMathLab &amp; Project 1 Assignment – The Cost of Driving:</b>

<b>Week 2</b>		<b>Equations and Inequalities</b>
Outcomes		Solve linear equations & inequalities, quadratic equations and absolute value equations & inequalities Determine and interpret the average rate of change in numeric, analytic and verbal representations Create and apply mathematical models to solve equation and inequality problems Apply the concepts, methods and tools of equations & inequalities to real-world problems
Readings		<ul style="list-style-type: none"> <li>• Linear Equations</li> <li>• Applications and Modeling with Linear Equations</li> <li>• Complex Numbers</li> <li>• Quadratic Equations</li> <li>• Applications and Modeling with Quadratic Equations</li> <li>• Other Types of Equations and Applications</li> <li>• Inequalities</li> <li>• 1.8 Absolute Value Equations and Inequalities</li> </ul>

Lectures	Chapter 1 Equations and Inequalities (MyMathLab Support Videos)
Discussion	<b>MyMathLab Exploration</b>
Assignments	<b>MyMathLab &amp; Project 1 Assignment – The Cost of Driving</b>

<b>Week 3      Graphs and Functions</b>	
Outcomes	Utilize the fundamental properties of functions to graph Analyze the graphical features of a variety of functions Construct functions in different representations through the use of transformations both algebraically and graphically Apply the concepts, methods and tools of graphs & functions to real-world problems
Readings	<ul style="list-style-type: none"> <li>• 2.1 Rectangular Coordinates and Graphs</li> <li>• 2.2 Circles</li> <li>• 2.3 Functions</li> <li>• 2.4 Linear Functions</li> <li>• 2.5 Equations of Lines and Linear Models</li> <li>• 2.6 Graphs of Basic Functions</li> <li>• 2.7 Graphing Techniques</li> <li>• 2.8 Function Operations and Composition</li> </ul>
Lectures	Chapter 2 Graphs and Functions (MyMathLab Support Videos)
Discussion	<b>Real-World Functions</b>
Assignments	<b>MyMathLab &amp; Project 2 Assignment – Critters</b>

<b>Week 4      Polynomial and Rational Functions</b>	
Outcomes	Identify features of non-linear functions from graphic, numeric and symbolic representations Solve and graph quadratic, polynomial and rational functions Model non-linear data algebraically and graphically Apply the concepts, methods and tools of polynomial & rational functions to real-world problems

Readings	<ul style="list-style-type: none"> <li>• 3.1 Quadratic Functions and Models</li> <li>• 3.2 Synthetic Division</li> <li>• 3.3 Zeros of Polynomial Functions</li> <li>• 3.4 Polynomial Functions: Graphs, Applications, and Models</li> <li>• 3.5 Rational Functions: Graphs, Applications, and Models</li> <li>• 3.6 Variation</li> </ul>
Lectures	Chapter 3 Polynomial and Rational Functions (MyMathLab Support Videos)
Discussion	<b>Polynomial and Rational Functions Website Review</b>
Assignments	<b>MyMathLab &amp; Project 2 Assignment – Critters</b>

<b>Week 5</b>	<b>Inverse, Exponential, and Logarithmic Functions</b>
Outcomes	<p>Understand the connection between exponential and logarithmic functions</p> <p>Create logarithms as the inverse of exponential functions</p> <p>Solve financial, scientific and real-world problems through exponential and logarithmic equations &amp; inequalities</p> <p>Apply the concepts, methods and tools of inverse, exponent and logarithmic functions to real-world problems</p>
Readings	<ul style="list-style-type: none"> <li>• 4.1 Inverse Functions</li> <li>• 4.2 Exponential Functions</li> <li>• 4.3 Logarithmic Functions</li> <li>• 4.4 Evaluating Logarithms and the Change-of-Base Theorem</li> <li>• 4.5 Exponential and Logarithmic Equations</li> <li>• 4.6 Applications and Models of Exponential Growth and Decay</li> </ul>
Lectures	Chapter 4 Inverse, Exponential, and Logarithmic Functions (MyMathLab Support Videos)
Discussion	<b>Exponential Functions in the Real-World</b>
Assignments	<b>MyMathLab &amp; Project 3 Assignment – Real World Math</b>

<b>Week 6</b>	<b>Systems and Matrices</b>
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Outcomes	<p>Model systems of multivariable linear equations using matrices</p> <p>Solve multivariable systems of linear equations using matrix operations</p> <p>Recognize when a mathematical solution does not exist in a matrix problem</p> <p>Apply the concepts, methods and tools of systems and matrices to real-world problems</p>
Readings	<ul style="list-style-type: none"> <li>• 5.1 Systems of Linear Equations</li> <li>• 5.2 Matrix Solution of Linear Systems</li> <li>• 5.3 Determinant Solution of Linear Systems</li> <li>• 5.7 Properties of Matrices</li> <li>• 5.8 Matrix Inverses</li> </ul>
Lectures	Chapter 5 Systems and Matrices (MyMathLab Support Videos)
Discussion	<b>Real World Math</b>
Assignments	<b>MyMathLab &amp; Project 3 Assignment – Real World Math</b>

<b>Week 7</b>	<b>Analytic Geometry</b>
Outcomes	<p>Identify the specific type of conic section from its equation</p> <p>Distinguish the geometric characteristics between circles, parabolas, hyperbolas and ellipses</p> <p>Create equations for conic sections including circles, parabolas, hyperbolas and ellipses</p> <p>Apply the concepts, methods and tools of analytic geometry to real-world problems</p>
Readings	<ul style="list-style-type: none"> <li>• 6.1 Parabolas</li> <li>• 6.2 Ellipses</li> <li>• 6.3 Hyperbolas</li> <li>• 6.4 Summary of the Conic Sections</li> </ul>
Lectures	Chapter 6 Analytic Geometry (MyMathLab Support Videos)
Discussion	<b>Mathematics &amp; Art</b>
Assignments	<b>MyMathLab &amp; Project 4 Assignment – Graphs PowerPoint Project:</b>

<b>Week 8 Sequences and Series</b>	
Outcomes	Recognize patterns in mathematical sequences and series Generate mathematical models for pattern Create equations for algebraic and geometric sequences Apply the concepts, methods and tools of sequences and series to real-world problems
Readings	<ul style="list-style-type: none"> <li>• 7.1 Sequences and Series</li> <li>• 7.2 Arithmetic Sequences and Series</li> <li>• 7.3 Geometric Sequences and Series</li> </ul>
Lectures	Chapter 7 Sequences and Series (MyMathLab Support Videos)
Discussion	<b>Final Mathematical Reflection</b>
Assignments	<b>MyMathLab &amp; Project 4 Assignment – Graphs PowerPoint Project:</b>

## Grading and Evaluation

Your grades will reflect the way in which you present and support your topics and positions in the various learning activities used in this course. The grades will be based on the quality and quantity of your comments and responses in the various activities.

***Be sure to review the discussion and assignment rubrics in the course for specific grading criteria.***

The various graded activities are weighted as follows:

<b>Course Element</b>	<b>% of Final Grade</b>
Assignments	
Discussions	
Quizzes	
Interactive Learning Activities	
<b>Total</b>	<b>100%</b>

Students will be expected to meet all the deadlines of the class as indicated throughout the course and in the syllabus. This is primarily so we don't get behind in the course. In addition, discussions cannot overlap from one week to the next. This is to ensure that all discussions and submissions take place within the week they are scheduled in order to be of value to the entire class as well as to help you not get behind. If there are extenuating circumstances, you will need to communicate that to the instructor and make arrangements accordingly, if appropriate.



**Late Assignments:** Exceptions are to be determined by the instructor on a case-by-case basis. There will be no opportunities for extra credit.

## Learner Success Guidelines

These guidelines are provided to help you succeed in your coursework:

- Participate in the class introduction activity on the first day of class.
- Submit ALL assignments by the posted due dates and times.
- Check your emails daily.
- Contact Portal Help for logon problems or Canvas Help for technical issues with Canvas.
- Participate fully in all threaded discussions.
- Contact your instructor if you have questions about an assignment or need additional help completing your work successfully. Academic dishonesty is grounds for dismissal from the program.

## Academic Policies

The following Academic Policies can be found in the [Student Resource Center](#).

- Grading Criteria
- Reasonable Accommodations Policy
- Student Attendance Policy
- Academic Honesty and Integrity Policy
- Student Engagement and the Granting of Academic Credit
- Copyright Policy

## Caveat

The above schedule, content, and procedures in this course are subject to change. All policies are superseded by the latest College Catalog available on our website:

<https://www.cambridgecollege.edu/student-rights-complaints-grievances/student-code-conduct>