

SYLLABUS

Code: MATH 021

Title: INTRODUCTORY ALGEBRA

Institute: STEM

Department: MATHEMATICS

Course Description: This course is an introduction to the concepts and methods of algebra. Numerical, graphical, and symbolic tools and techniques are used to apply algebra to real-world situations. Topics include creating and translating algebraic expressions, solving linear equations, inequalities and formulas, graphing and writing linear functions, solving linear systems, solving quadratic, rational, cubic, and radical equations, and simplifying polynomial and radical expressions. Applications are included throughout the course. This is a developmental course in foundational studies and will not be counted towards degree requirements.

NOTE: Students taking MATH 021 may not enroll simultaneously in any other math course.

Prerequisites: MATH 015 or MATH 012 or satisfactory completion of the College's foundational studies requirement in computation.

Credits: 4

Lecture Hours: 4

Lab: 0

REQUIRED TEXTBOOK/MATERIALS:

See your instructor addendum for a complete list of required materials for your section.

1. **Textbook:** The Brookdale Mathematics Department: MATH 021 Introductory Algebra. This ebook is available for free online – the link is in your Canvas course. Your instructor may require that you bring a hard copy to class. A hard copy of the ebook can be purchased at the College bookstore.
2. A WebAssign (WA) access code is required for online homework. The access code can be purchased directly from the publisher or at the College bookstore.
3. **Notebook:** You should use a loose-leaf notebook. Use the front of the notebook for class notes and in-class problem solving, and the back of the notebook for homework. A loose-leaf notebook is preferred over a spiral-bound notebook since your instructor may wish to collect assignments periodically. Returned assignments can be reinserted into their proper location in a loose-leaf notebook.
4. **Calculator:** You will need a scientific calculator for this course, such as the TI 30x Multiview. Calculator based questions will be included throughout the course and the calculator will be used to explore and develop concepts. (Note: Your instructor will use a graphing calculator for classroom demonstration, but you do not need to have one. A graphing calculator may not be used for testing.)
5. **Graph paper:** You should bring graph paper to each class.
6. **Ruler:** You should bring a small ruler to each class.

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ADDITIONAL TIME REQUIREMENTS:

OTHER TIME COMMITMENTS:

- In addition to the regular class hours, you will need to set aside time each week for homework. The weekly time will vary by topic and level of difficulty, but as an estimate, you should expect two homework hours for *each* class hour per week. For example, if your class meets for four hours per week, you should expect to spend about **eight** hours per week on homework.
- If you are having any difficulty with the course material, you may need to allow time to see your instructor during office hours or to get help in the Math Lab.

COURSE LEARNING OUTCOMES:

Upon completion of this course, students will be able to:

- Demonstrate the mathematical skills appropriate to this course.
- Use algebraic variables, expressions, and equations to analyze and solve application problems.
- Explain how a linear function relates to a problem situation.
- Interpret solutions in the context of the situation.

COURSE GOAL:

Upon completion of this course, students will be able to:

- Successfully participate in a next-level math course or other course for which this course is a prerequisite.

GRADING STANDARD: In this course, you will be evaluated by means of tests, labs, quizzes, and possibly homework.

A. TESTS

There will be three tests, one after each unit. Each test is cumulative and covers material from the beginning of the course. All supporting work must be shown on tests in order for your instructor to properly assess your understanding of the material. The tests will be given in class and it is expected that you will be in class to take the test on the day it is given. If you are very ill (verifiable with a doctor's note) or you have some other emergency, you *must* contact your instructor immediately.

Retesting for Test 1 and Test 2: If you pass a test with a grade of 70 or higher, you may not retest for a higher grade. For Test 1, if your grade is below 70, you have one opportunity for a retest. For Test 2, if your grade is below 70, you have one opportunity for a retest. The decision about retesting should be made in consultation with your instructor. A passing retest grade is recorded as a 70. Before retesting you *must* meet with your instructor and be prepared to show all your homework and corrections on the test. Your instructor may require additional work and/or a special session in the Math Lab. Your instructor will determine when you are ready for the retest. The retest must be taken within two weeks of the day the test was given in class, unless your instructor has made different arrangements. The grade on the retest, which will not be recorded as higher than 70, will be the grade used to compute your average for the course.

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B. LABS/QUIZZES/HOMEWORK

There are daily labs in this course. They may be assigned in groups or individually. The labs contain problems that reinforce the concepts and skills learned in class. There are also periodic quizzes and your instructor may also choose to use certain homework assignments for evaluation.

GRADING

Each test is graded on the basis of 100 points, the labs are averaged to form your "lab grade", and the quizzes are averaged to form your "quiz grade." Your final course average is determined by a weighted average as follows:

| | |
|-------------------------|-----|
| Test 1 | 20% |
| Test 2 | 30% |
| Test 3 | 30% |
| Quiz/Lab/Homework/Other | 20% |

FINAL GRADE

Your final grade is determined as follows:

| If your final course average is | Your final grade is |
|---------------------------------|----------------------|
| 90 – 100 | A |
| 88 – 89 | A- |
| 86 – 87 | B+ |
| 80 – 85 | B |
| 78 – 79 | B- |
| 76 – 77 | C+ |
| 70 – 75 | C |
| 65– 69 | F or INC (see below) |
| Below 65 | F |

Incomplete

INC is only given at the discretion of your instructor. This may occur:

1. If your final average is 65 – 69. In this case, you must pass a comprehensive final exam with a minimum grade of 70 to earn a grade of C for the course. Failure to pass this test will result in a grade of F.

OR

2. In documented cases of hardship or emergency. In this case, you must meet with your instructor to discuss the work that must be completed to earn a grade in the course.

All work must be completed within 21 days after the end of the term, exclusive of official college closings.

Withdrawal

You may withdraw from the course, without penalty, up to a date set by the College. If you do not withdraw from the course but stop attending, your grade at the end of the semester will be F.

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COURSE CONTENT: (TEXT SECTION)

Unit 1: In this unit, you will learn and apply problem solving techniques, build input-output tables, use the rectangular coordinate system to construct graphs, and evaluate and simplify linear, exponential, quadratic, cubic, rational, and radical expressions.

Unit 1 Outcomes: You will:

- Identify and apply Polya's four steps for problem solving (1.1)
- Use the basic language for sets of numbers and for operations (1.1)
- Build an input-output table from a problem setting (1.1)
- Read and interpret data in single-rule and conditional-rule tables (1.1)
- Identify variables, constants, numerical coefficients, and expressions (1.2)
- Change word phrases into algebraic expressions (1.2)
- Express rules in words and in algebraic notation (1.2)
- Identify and plot points in a rectangular coordinate system (1.3)
- Build a graph from an input-output table (1.3)
- Read and interpret a graph (1.3)
- Simplify fractions containing variables (1.4)
- Evaluate algebraic expressions by substituting the value(s) of the variable(s) (1.4)
- Simplify basic exponential expressions (1.4)
- Evaluate radical expressions by using the multiplication and division properties of radicals (1.4)
- Simplify expressions using the rule for order of operations (1.5)
- Use the associative, commutative, and distributive properties to combine like terms and rewrite algebraic expressions (1.5)
- Simplify, add, subtract, and multiply polynomial expressions (1.6)
- Evaluate expressions (1.6)
- Define a function (1.7)
- Find the domain and range of a function (1.7)
- Use the vertical-line test to determine whether a graph represents a function (1.7)
- Use function notation to evaluate a function at an input value (1.7)
- Rewrite a function statement as an ordered pair (1.7)
- Interpret a function statement in the context of the problem situation (1.7)

Unit 2: In this unit, you will solve one-variable linear equations, proportions, and inequalities using algebraic methods, solve formulas, and explore concepts related to linear functions.

Unit 2 Outcomes: You will:

- Know the definition of an equation (2.1)
- Determine whether a number is a solution to an equation (2.1)
- Identify equations and graphs as linear or nonlinear (2.1)
- Write English sentences as linear equations (2.1)
- Find the solution to a linear equation from a table or from a graph (2.1)
- Build an input-output table and a graph for linear, quadratic, cubic, radical, and rational equations ((2.2)
- Find the solution to a linear, quadratic, rational, radical, or cubic equation from a table or from a graph (2.2)
- Solve linear equations containing parentheses (2.2)
- Set up and solve equations from applications and interpret the solution (2.2)
- Solve linear equations with variable terms on both sides of the equation (2.3)

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- Solve proportions using cross multiplication (2.4)
- Use properties of equations to write equivalent equations (2.4)
- Solve equations with fractions by clearing the denominator first (2.4)
- Write sets of numbers using inequalities (2.5)
- Graph inequalities on a number line (2.5)
- Use the properties of inequalities to solve one-variable linear inequalities (2.5)
- Graph solutions to inequalities on a number line (2.5)
- Write and solve inequalities for application settings (2.5)
- Solve a formula for one variable (2.6)
- Evaluate formulas (2.6)
- Find horizontal-axis and vertical-axis intercepts from an equation (2.7)
- Interpret the meaning of intercepts in a problem setting (2.7)
- Write the equation for horizontal and vertical lines (2.7)
- Find the slope of a line from a graph, from a table, or from the slope formula (2.8)
- Find the slope of horizontal and vertical lines (2.8)
- Write the meaning of slope as a rate in the context of a problem situation (2.8)
- Recognize the slope concept in a variety of situations (2.8)
- Find the slope and vertical-axis intercept from a linear equation (2.9)
- Find a linear equation from ordered pairs, data, a table or a graph (2.9)
- Find the rules for input-output tables (2.9)

Unit 3: In this unit, you will solve systems of linear equations using three different methods and apply algebraic skills to solve application problems. You will also be introduced to concepts in Statistics and Probability.

Unit 3 Outcomes: You will:

- Use slope and a point to graph a line (3.1)
- Use slope and a point to write the equation of a line and draw its graph (3.1)
- Recognize equations of lines that are parallel (3.1)
- Set up and graph linear equations from applications and interpret the slope and intercepts (3.2)
- Identify a system of equations and know the definition of a solution to a system (3.3)
- Solve a system of equations by graphing (3.3)
- Give the geometric meaning for a system of equations having no solution, one solution, or infinitely many solutions (3.3)
- Solve a system of equations by substitution (3.4)
- Solve a system by the method of elimination (3.5)
- Solve application problems by writing and solving a system of equations (3.5)
- Solve a variety of application problems using appropriate algebraic tools (3.5)
- Interpret the results in the context of problems related to systems of equations (3.5)
- Distinguish between qualitative and quantitative data (Introduction to Statistics) (3.6)
- Create a bar graph or histogram and interpret data displayed in a graph (3.6)
- Evaluate the mean, median and mode of a set of numbers (3.6)
- Use a tree diagram to write the sample space of a probability experiment (Introduction to Probability) (3.7)
- Find probabilities of events using sample spaces (3.7)
- Distinguish between empirical and theoretical probability (3.7)
- Applications of Systems of Equations, Statistics and Probability summary/practice class (3.8)

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DEPARTMENT POLICIES:

The Math Department wants you to be successful in this course. Because of this, we have compiled a list of strategies and behaviors.

Attendance and class participation

- If you want to be successful in this course, attend every class.
- Come to class on time, and stay for the entire class period. If you are late or leave during class, you will miss important class material and you will also distract your classmates and your instructor. (See the Student Conduct Code)
- Turn off your cell phone during class. You and your classmates need to be free from distractions. (See the Student Conduct Code)
- Bring your book, supplementary materials, and calculator to every class.
- Respect your classmates and your instructor. Listen carefully to questions asked and answers given. Treat all questions with respect.
- Participate fully in class. Volunteer answers, work problems, take careful notes, and engage in discussions about the material. Above all, stay on task.
- Contribute your share to your in-class group work and do your best to make the group experience a positive one for all members.
- Do your own work on tests and quizzes. Cheating will not be tolerated. (See the Academic Integrity Code.)

Homework

- Homework is the way you practice the ideas and skills that are introduced in class. To be successful on the tests, you must do the homework. Homework may be collected and homework questions may be included on quizzes or tests. All the homework assignments are in the Math 021 assignment booklet which your instructor will give you, or in WebAssign (see Required Materials). Homework may be online and may be graded.
- When you do the homework, write down all supporting work. Using the correct process is at least as important as getting the correct answer, so your work and steps are very important.
- Remember to check your answers. They will either be in the back of the text or in the homework assignment booklet.
- If there are questions you can't get or don't understand, ask about them at the beginning of the next class. If you have trouble with more than a few problems, try starting your homework in the Math Lab, where help is available.

Absence

- If you are sick and an absence is unavoidable, please call or email your instructor. You are still expected to read the course material and to try to do the homework.
- Make time to see your instructor when you return so that you can get any papers you missed.
- You will not be able to make up labs.
- Remember that you are expected to be in class for the tests.

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Getting Help

After you have tried the homework, there are ways to get help:

- Look in your text and your class notes for examples similar to the problems you are finding difficult.
- See your instructor during office hours or make an appointment. Bring the work you have done.
- Go to the **Math Lab** to get extra help on your homework or simply go and do your homework there. Someone will be there if you get stuck. You don't need an appointment to use the Math Lab.
- Form a **study group** with other class members. Working with other students can be a great way to learn. If you have a group to work with, consider meeting and working together in the Math Lab.
- Your textbook may have a complete solutions manual available in the Math Lab, which can be used in the Math Lab.
- You can use the computers in the computer lab within the Math Lab to do work related to your math course.
- In the Math Lab, you can get help on how to use your calculator.

Visit the [Math Lab website](#) to view hours and other useful information about the Math Lab.

COLLEGE POLICIES:

As an academic institution, Brookdale facilitates the free exchange of ideas, upholds the virtues of civil discourse, and honors diverse perspectives informed by credible sources. Our College values all students and strives for inclusion and safety regardless of a student's disability, age, sex, gender identity, sexual orientation, race, ethnicity, country of origin, immigration status, religious affiliation, political orientation, socioeconomic standing, and veteran status. For additional information, support services, and engagement opportunities, please visit www.brookdalecc.edu/support.

For information regarding:

- ◆ Brookdale's Academic Integrity Code
- ◆ Student Conduct Code
- ◆ Student Grade Appeal Process

Please refer to the [BCC STUDENT HANDBOOK](#) AND [BCC CATALOG](#).

NOTIFICATION FOR STUDENTS WITH DISABILITIES:

Brookdale Community College offers reasonable accommodations and/or services to persons with disabilities. Students with disabilities who wish to self-identify must contact the Disabilities Services Office at 732-224-2730 (voice) or 732-842-4211 (TTY) to provide appropriate documentation of the disability, and request specific accommodations or services. If a student qualifies, reasonable accommodations and/or services, which are appropriate for the college level and are recommended in the documentation, can be approved.

MENTAL HEALTH:

- Mental Health Crisis Support: From a campus phone, dial 5555 or 732-224-2329 from an external line; off-hours calls will be forwarded to BCC police (2222 from a campus phone)
- Psychological Counseling Services: 732-224-2986 (to schedule an appointment during regular hours)

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The syllabus is intended to give student guidance in what may be covered during the semester and will be followed as closely as possible. However, the faculty member reserves the right to modify, supplement, and make changes as the need arises.