

Bucks County Community College  
Department of Mathematics, Science, & Technology

**MATH120 - COLLEGE ALGEBRA  
BASIC COURSE INFORMATION**

**Spring 2008 Section U81 Mon/Wed 6:30-8:10 PM**

Mr. Donald Arrowsmith  
Office: Upper Bucks Campus room 209  
Office Hours: Tue 12:15-12:45 PM,  
Wed 6:00-6:30 PM,  
Thur 1:00-1:30 PM,  
and by appointment  
Email: arrowsmi@bucks.edu  
Web Site: www.bucks.edu/~arrowsmi

**Number of Credits: 4**

**I. Course Objectives**

This course is designed to strengthen and increase the understanding of basic algebraic concepts before a student undertakes advanced study in mathematics. Topics include algebra of the real numbers, algebraic, exponential, and logarithmic functions and their graphs, systems of equations, inequalities, and absolute value.

**Prerequisite:** MATH103 Intermediate Algebra (C or better) or Math Placement of 7.

**II. Textbook and other aids**

- A. The textbook is *College Algebra, 9th Edition* by Lial, Hornsby, Schneider (ISBN 978-0-321-22757-7) published by Pearson Education, Addison-Wesley.
- B. A *Student Solutions Manual* (ISBN 978-0-321-22753-9) contains detailed solutions to all odd-numbered problems.
- C. The bookstore package (ISBN 978-0-536-07303-7) includes the textbook, solutions manual, video lectures and MyMathLab online access code. This package is the best value! The online access code will give you access to the book, study aids and detailed explanations of selected problems at the publisher's web site.
- D. The MyMathLab online access code can be purchased separately from the publisher. This could be a cost saving approach if you are able to effectively use online access to the book in lieu of buying a printed copy
- E. The *Digital Video Tutor* (ISBN 0-321-23731-5) set will give you a different explanation of the material along with solutions to selected odd-numbered problems.
- F. Other student aids are available from the publisher. See the link at my web site.

### III. Course Content and Direction

#### A. Learning Goals

Course Specific: The student will be able to:

1. develop an understanding and apply the concepts and procedures for solving equations and inequalities and for simplifying expressions.
2. demonstrate the techniques of solving a variety of applications of equations.
3. develop a proficiency in solving linear, quadratic, polynomial, and rational functions, and in mastering techniques for graphing these functions and describing their domain and range.
4. develop skill in using a graphing calculator.
5. accurately use logarithmic and exponential functions and develop the skill to graph and solve logarithmic and exponential equations.
6. simplify algebraic expressions involving operations of arithmetic, exponents, radicals, fractions and factoring of polynomials.
7. solve linear, quadratic, polynomial, absolute value, radical, exponential, logarithmic equations and systems of linear equations.
8. solve applications of linear and quadratic equations.
9. solve linear, quadratic, polynomial, absolute value, and rational inequalities and write the solutions in interval notation.
10. graph linear, quadratic, polynomial, exponential, absolute value, radical, logarithmic, and rational functions and conic sections.
11. perform operations of functions, find composition of functions, and describe increasing, decreasing, constant intervals, domain, range, and points of discontinuity.
12. find equations of lines, given two points, a point and the slope, parallel or perpendicular lines, and a point.
13. find the distance between, and the midpoint of, the segment, given two points.

Core Learning Goals: Category I: Math or Science: The student will be able to:

14. develop the ability to analyze, interpret, and apply quantitative information.

Core Learning Objectives: Category I: Math or Science: The student will be able to:

15. accurately translate descriptive problems into mathematical formulas and solve them.

Category III: Critical Thinking/Problem Solving: The student will be able to:

16. demonstrate an understanding of solving problems by:
  - a. recognizing the problem
  - b. reviewing information about the problem
  - c. developing plausible solutions
  - d. evaluating the results

#### B. Course Topics

1. Review Topics
  - a. The Real Numbers
  - b. The Field Axioms
  - c. Operations on Polynomials (+, -, \*, /)
  - d. Factoring
  - e. Algebraic Fractions (reduction, +, -, \*, /)
  - f. Exponents (integer, rational)
  - g. Radicals and Radical Expressions

- h. Complex Numbers
2. Solution of Equations and Inequalities
    - a. First Degree Equations
    - b. Formula Manipulation
    - c. First Degree Inequalities (visualize solution set)
    - d. Absolute Value Equations
    - e. Absolute Value Inequalities
    - f. Quadratic Equations (factoring, completing the square, quadratic formula)
    - g. Quadratic Inequalities
    - h. Radical Equations
    - i. Applications (1<sup>st</sup> and 2<sup>nd</sup> degree)
    - j. Rational Inequalities
  3. Relations and Functions
    - a. Cartesian Coordinate System and the Distance Formula
    - b. Relations (domain, range, rule, graph)
    - c. Functions (domain, range, rule, graph)
    - d. Functional Notation
    - e. Algebra of Functions (+, -, \*, /)
    - f. Composition of Functions
    - g. Linear Functions (slope-intercept form, graphs)
    - h. Quadratic Functions
    - i. System of Equations (2x2, 3x3)
  4. Polynomial Functions
    - a. Division of Polynomials
    - b. Synthetic Division
    - c. Remainder and Factor Theorem
    - d. Rational Root Theorem
    - e. Graphs of Polynomial Functions
    - f. Rational Functions
  5. Exponential and Logarithmic Functions
    - a. Inverse Functions (existence, rule, domain, range)
    - b. Exponential Functions (rule, domain, range)
    - c. Logarithmic Functions (rule, domain, range)
    - d. Laws of Logarithms
    - e. Logarithmic and Exponential Equations
    - f. Applications of Logs

#### **IV. Teaching Methods to be used**

- A. I will use lecture, recitation, problem solving, and class discussion as appropriate.
- B. I make extensive use of email and a web site to keep you aware of class business. I frequently send important information regarding homework, tests, and grades, so you should check your email regularly. I also add important information, including this document and the assignment sheet, to the class web site and will notify you of updates to it by email and in class. The college assigns you a unique student email address when you register for the first time. You

can access that mailbox from anywhere using a web browser or you can forward that address to another address that you are accustomed to using. If you will not be using your college address, please make sure that you give me an accurate email address and keep me informed if it changes. If you don't have ready access to a computer at home, use a computer in the library or elsewhere on campus.

- C. An assignment sheet will list all homework problems from the text. Please attempt all assigned problems and bring your questions to class. All problems assigned are odd-numbered so the answers are listed in the back of the textbook. Homework will be collected with each test and selected problems will be graded and used as a portion of that test grade. In order to get credit for a given homework problem, I need to be able to find it (organize and label it), read it (write neatly), see the work (don't just copy the answer), and see the correct answer.
- D. Calculators or graphing calculators may be used during class and during any test and the final exam. You are not required to have one, but you may find it useful here and in other classes. Many types are available but examples in the book and by me are geared towards Texas Instruments (TI) models 83, 83+, 84, 84+, etc. that are readily available at retail stores and online.
- E. Study Requirements: It is important to study two hours for each class hour. In Mathematics you learn by doing:
  1. Read the assigned section of the textbook and go over all example problems.
  2. Do assigned homework problems. Check your answers in the back of the book, in the solutions manual if you have it, or in the next class.
  3. Do not hesitate to get extra help from me, a friend, or the Tutoring Center.
- F. Study Skills: Another objective for this course is to increase your awareness of how personal habits and attitudes influence your success in this class, in other classes, and in your employment. Some works habits to practice include:
  1. Setting realistic goals and developing plans of action to achieve them.
  2. Taking responsibility for your learning by monitoring your progress and making changes in behavior as necessary.
  3. Setting and meeting deadlines.
  4. Setting priorities and using time efficiently.
  5. Using outside resources to reach your goal.

By fulfilling the requirements, making a point of seeing me during my office hours and availing yourself to the support services of the Tutoring Center, you will attain the skills necessary to be successful in this course.

## V. Withdrawal

Withdrawal is allowed up to **Tuesday, April 8, 2008**, and can be accomplished by filling out the appropriate form which you may obtain at the reception desk, from the UBC administrative suite, or in the Admissions Office. After that date, you may not withdraw from the course.

## VI. Extra Help

- A. My office hours are listed at the top of this sheet. If you cannot be available during scheduled hours, we can select a time which is mutually convenient.

- B. Tutoring help is available, free of charge, in the Tutoring Center in Upper Bucks Campus room 126, across from the Library, or at the Newtown Campus on the first floor of the Library in room L121. Their hours are listed at the BCCC web site.
- C. Use the *Student Solutions Manual* if you have it.
- D. If you have them, watch the video tutor discs to see alternate explanations of the material on your PC.
- E. If you have a MyMathLab access code, you can use the many study aids that are available there.
- F. See my web site for links to several online help locations.
- G. All students with disabilities are required to register with the Office for Disability Services on campus for the provision of appropriate accommodations. If you have a documented disability which requires classroom accommodations, please notify me.
- H. Student Services has counseling available if you have a personal, family, work or similar problem that you would like to discuss. They also publish short TIPS for common student problems. A link to these is shown at my web site.

**VII. Please read the statement on cheating and plagiarism on page 159 of the current BCCC Catalog (2006-2008). College policies will be strongly enforced!** Penalties for cheating are severe and range from a requirement to redo the work, an automatic failing grade for the work, automatic withdrawal or failure of the course, up to a three year suspension from the college.

### **VIII. Attendance**

- A. I expect you to attend every class unless absence is unavoidable. Excessive absence may result in my filing an instructor-initiated Withdrawal. I follow the syllabus rigorously, so if you do need to miss a class because of illness or an emergency, you will know exactly what was discussed and what homework is assigned.
- B. You should plan your day such that you can arrive to class on time and stay until the end. If you know that you be delayed or must leave early, it would be considerate of you to email me ahead of time. It's not necessary to call the college.
- C. Please show respect during class for me and your fellow students by not having side conversations, keeping your cell phone off or its ringer set to quiet, staying awake, not eating in class, etc.

### **IX. Grading Procedures**

- A. There will be three in-class tests. Randomly selected homework problems will form a portion of each test grade. A departmental Final Examination will be scored as the equivalent of two tests and will cover material from the entire course.
- B. I normally prepare a pretest as a review for each test and publish the content, answers, and solutions at my web site.

C. In determining the Final Course Grade, the lowest of the five grades will be dropped and the remaining four will be averaged. The standard BCCC scale will be used for the course grade:

A	90-100	C+	77-79	D	60-66
B+	87-89	C	70-76	F	0-59
B	80-86	D+	67-69		

D. Mid-term grades will be reported as a “S”atisfactory if your average at that point is 70 or greater. Otherwise, I will report an “U”nsatisfactory.

E. I will keep an up-to-date list of test grades at the class web site. I will ask you to make up a six-digit number to identify yourself in that list.

F. If you know that you will be absent for a scheduled test, speak to me ahead of time. I may be able to set up an alternate testing date at the UBC or Newtown Testing Center.

G. If you are absent for a scheduled test without alerting me, then that will become your drop grade. If you are absent for more than one test, the Final Examination grade will be used to replace that missing grade. No make-up tests will be given. No extra credit work is available.

H. All students must take the Final Examination in order to receive a passing grade.

I. You have the responsibility to, and are urged to, retain all graded work until you receive your final grade from the college for this course. If you believe your grade is incorrect, refer to the “Academic Policies” section on page 135 of the 2006-2008 BCCC Catalog for more information.

*revised 1/28/08*