**CCBC, Summer 2016 School of Mathematics and Science**

**MATH 163, College Algebra, E5N Math Department**

**Description:** Explores the nature and scope of college mathematics through the study of functions. Topics include the study of polynomial, rational, radical, piece-wise defined, and absolute value functions and their graphs and applications as well as modeling with these functions. Additional topics include complex numbers, the binomial theorem, inverse functions, operations with functions, exponential and logarithmic functions and their graphs and applications.

**Prerequisites:** RDNG 052 or LVR2) and (ENGL 052 or LVE 2) or (ESOL 052 or LVE 2) and Algebra I and II in high school and a satisfactory score on the placement exam; or (MATH 083 or LVM 3).

1. Basic Course Information
   1. Instructor: Anthony Calise Website: [www.mrcalise.weebly.com](http://www.mrcalise.weebly.com)
   2. Office: E.BESS 316

Email Address: acalise2@bcps.org

* 1. Office Hours: MTWR 7:55pm – 8:55pm
  2. Mathematics Department Phone Number (Essex): 443-840-1837
  3. Class Meeting Days and Times: MTWR 6:00pm – 7:55pm

Essex Campus E.BESS 316

* 1. Statement of Student Out of Class Work Expectations:

This is a three-credit/billable hour course offered over 14 weeks. You are expected to complete **at least 6 hours** of work **per week** **outside** of the class, including reading, class preparation, homework, studying, etc.

* 1. Materials:
     1. Text:  *College Algebra and Trigonometry,* by Julia Miller and Donna Gerken, 1st edition *or* an ALEKS Access
     2. A graphing calculator is recommended but not required for this course. A recommended calculator is the TI-83 or TI-84. Calculators with advanced capabilities, such as a TI-89, are not permitted for use.

1. Course Goals Overall
   1. Course objectives as listed on the official Common Course Outline

Upon successfully completing the course, students will be able to:

* + 1. produce and compare graphs of absolute value and piecewise-defined functions;
    2. solve inequalities in one and two variables;
    3. solve absolute value inequalities in one variable;
    4. identify domain and range of functions;
    5. produce and compare graphs of functions, using translations, symmetry, end behavior, and asymptotes;
    6. combine two or more functions using addition, subtraction, multiplication, division, or functional composition;
    7. identify the inverse of a given function;
    8. identify the function, given information about the function;
    9. model numerical data using quadratic functions to further analyze data and predict values;
    10. perform operations with functions;
    11. produce and compare graphs of exponential and logarithmic functions;
    12. solve problems using exponential and logarithmic functions;
    13. produce and compare graphs of polynomial functions;
    14. identify the zeros of polynomial functions; apply the Fundamental Theorem of Algebra;
    15. identify the equation of a polynomial using the Theory of Equations and given sufficient information about its zeroes;
    16. apply the Binomial Theorem to determine the coefficients of a polynomial;
    17. solve rational equations;
    18. produce graphs of rational functions;
    19. construct a solution to real world problems using problem methods individually and in groups;
    20. examine the mathematical contributions made by people from diverse cultures throughout history;
    21. articulate a solution to mathematical problems; and
    22. apply appropriate technology to the solution of mathematical problems.
  1. Major Topics as listed on the official Common Course Outline

1. Absolute value equations and inequalities
   1. Absolute value equations
   2. Absolute value inequalities
2. Functions
   1. Review domain, range, and functional notation
   2. Modeling data with linear regression function
   3. Review parallel and perpendicular functions
   4. Review quadratic functions and their graphs
   5. Graphing techniques using shifting/stretching techniques
   6. Absolute value and piecewise defined functions and their graphs
3. Polynomial Functions
   1. Graphs of polynomial functions
   2. Zeros of polynomial functions
   3. Complex numbers and theory of equations
   4. Fundamental Theorem of Algebra
   5. Modeling with polynomial functions
4. Binomial Theorem
   1. Expanding a binomial
   2. Finding a term in a binomial expansion
5. Rational Functions and Radical Functions
   1. Graphs of rational functions
   2. Graphs of radical functions
   3. Equations and inequalities of rational and radical functions
6. Combinations of Functions
   1. Arithmetic operations on functions
   2. Composition of functions
   3. One-to-one functions
   4. Inverse functions
7. Exponential and Logarithmic Functions
   1. Definition and graphs of exponential functions
   2. Definition and graphs of logarithmic functions
   3. Properties of logarithms
   4. Solving exponential and logarithmic equations
   5. Applications of exponential and logarithmic functions
   6. Rationale

College Algebra is the first course in the Calculus track. The students will be introduced to the basics of linear and quadratic equations and inequalities, basic polynomial and rational functions, transcendental functions, and exponential and logarithmic functions. This course is a prerequisite for Pre-Calculus and will lay the ground work for the more intensive topics covered in that course.

1. Evaluation
   1. Requirements: There will be 3 Unit Exams during the semester and your highest two scores will count 20% each towards your overall grade and your lowest Unit Exam will count as 15% of your overall grade. There is also a written research paper to be explained in class which is worth 10% of your overall grade. A cumulative Final Exam which is worth 25% of your overall grade as well as 3-4 quizzes where the lowest grade will be dropped. The quiz scores as well as HW will make up 10% of the overall grade. Most HW is optional if it is graded you will be made aware in class and on my website.
   2. Instructor’s grading policy
      1. Unit Test(s) 55 % of course grade
      2. Project 10 % of course grade
      3. Comprehensive Final Exam 25 % of course grade
      4. Quizzes/HW 10 % of course grade

A final course grade will be assigned using the following criteria:

|  |  |
| --- | --- |
| **Final Average** | **Final Grade** |
| At least 90% | A |
| At least 80% and less than 90% | B |
| At least 70% and less than 80% | C |
| At least 60% and less than 70% | D |
| Less than 60% | F |

* 1. Math Department Attendance policy:
     1. You are expected to attend ALL scheduled classes.
     2. Attendance is critical to student success in college.
     3. Satisfactory attendance is defined to be at most 6 hours of unexcused absences.
     4. Documentation of the reason for your absence(s) may be required.
     5. The instructor may count each unexcused tardy arrival as an absence and each unexcused early departure as an absence.
  2. Math Department Audit policy: Students may change from credit to audit only during the published 50% refund period, as indicated in the CCBC academic calendar. Students who audit are required to attend class, participate in course activities, and complete assignments (except for tests and the final exam) in accordance with instructor guidelines and due dates. For students who do not meet these requirements, the instructor may change their grade from AU to W.

1. Course Procedures
   1. Course related policies and procedures: [WWW.MRCALISE.WEEBLY.COM](http://WWW.MRCALISE.WEEBLY.COM)
   2. College wide syllabus policies [“For college wide syllabus policies such as the Code of Conduct related to Academic Integrity and Classroom Behavior or the Audit/ Withdrawal policy, please go to the Syllabus Tab on the MyCCBC page](https://myccbc.ccbcmd.edu/Pages/Default.aspx).”
   3. Contact information for course-related concerns: Students should first attempt to take concerns to the faculty member. If students are unable to resolve course-related concerns with the instructor, they should contact Mathematics Department Essex coordinator, Sylvia Sorkin, at [ssorkin@ccbcmd.edu](mailto:kduckworth@ccbcmd.edu) or 443-840-2661.
   4. Course calendar/schedule

Academic Calendar and final exam schedule:

http://www.ccbcmd.edu/Resources-for-Students/Registering-for-Classes/Academic-Calendar.aspx

Tentative Homework List \*The following sections will be covered in a review format: 1.1, 1.3, 2.1, 2.5

|  |  |
| --- | --- |
| **McGraw Hill Book** | **Tentative Homework Problems** |
| 1.1\* | 13-29 odd, 33-37 odd, 45-63 odd |
| 1.2 | 7-27 odd |
| 1.3\* | 5-19 odd, 45-65odd,79,81 |
| 1.4 | 9-43 odd, 55-61 odd |
| 1.6 | 9-25 (odd),55,61,75,77,103,127 |
| 1.7 | R1, R3, 9,11,17,21,25,27,29,37-55 odd, 61,63,83 |
| 2.1\* | 45-61 (odd) |
| 2.3 | 35-49odd, 73, 97,99,103 |
| 2.4 | 4,21,29,81-87 odd |
| 2.5\* | 5,9,11,23,29,37,39,41,63,65 |
| 2.6 | 1-39 odd, 47,49,63-67odd, 79,81,95 |
| 2.7 | 21-25 odd, 29, 31, 47, 61-65 odd, 87, 89, 93, 97, 101 |
| 2.8 | R1- R4, 9-33 eoo, 47-55odd, 65-71odd, 99,103, 105 |
| 3.1 | 1-29 odd, 33,35,43,47,71,73 |
| 3.2 | 13-29 odd, 39, 45-51 odd, 61,67,71 |
| 3.3 | 7-17odd, 23,27,31,41,43,47,55,65,69,71,77 |
| 3.4 | 7, 9, 15-27odd, 39,45,47,49,59 |
| 3.5 | 13-23odd, 29,31,39,41,57,59,67-83odd |
| 3.6 | 5,7,19-55eoo, 59-75eoo |
| 4.1 | 1-9 odd, 13-21 odd, 31, 39-45odd, 55,71-75odd |
| 4.2 | 15-35eoo, 37-45odd, 55,57 |
| 4.3 | 9-23odd, 25-43odd, 65-85odd |
| 4.5 | 5-23odd, 37-47odd, 61,69 |
| 8.5 | 11-15odd, 29,31 |

This syllabus may be changed with notification to the class.