

College Algebra

Math 203-E1

Spring 2012

Instructor: Mary E. Sullivan

Office: S-109

In-Person Office Hours:

- MWF: 9:00 – 10:00
Th: 9:30 – 10:30

E-mail: msullivan@massasoit.mass.edu

Phone: 508-588-9100 x1653

Virtual Office Hours: By appointment

Website: www.profsullivan.com

Description: This course covers the algebra necessary for successful completion of the Precalculus/Calculus sequence while introducing functions, graphing, and graphing utilities. Topics include the operation and use of graphing utilities, polynomial operations and functions, absolute value equations and functions, radical and rational exponent functions, piecewise functions, and composite functions.

Prerequisite: C- or better in Intermediate Algebra and Trigonometry (MATH112) or waiver by placement testing results or departmental approval.

Critical Thinking: This is a critical thinking course that will help to improve your quality of thinking and decision-making. Specifically, you will be expected to organize and connect ideas throughout the course and view situations from different perspectives. You will be asked to apply quantitative and/or qualitative techniques, tools, formulas, and theories in the solution of real-life problems and to recognize when to apply those techniques, tools, formulas, and theories.

Required Materials: MyMathLab/MyStatLab Standalone Student Access Kit, Pearson: ISBN: 0-321-19991-x This access kit is available at the college bookstore or for purchase directly at www.coursecompass.com. The code that is included with this access kit will allow you to access the e-book and the assignments for the course.

After you obtain the access kit, go to www.coursecompass.com and use the Course ID to access the course. You will be able to access the course one week before the beginning of the semester.

Optional Text: *Precalculus Enhanced with Graphing Utilities*, Sullivan, Sullivan, 4th edition, Pearson/Prentice Hall, 2006. Most students find that the e-book and my lecture notes are sufficient and that they do not need the text.

Calculator: A TI-83 or TI-84 graphing calculator is required. You may rent a calculator from Massasoit Community College for a small fee. There is a rental form located on the course homepage in CourseCompass.

Teaching Procedures: This is an online course, so you will be expected to work through the course by taking advantage of several tools intended to help you understand and learn the concepts. These tools include lecture notes, videos, online guided exercises, and online assignments.

MyMathLab Assignments: Assignments are due on Tuesdays, Thursdays, and Saturdays. There are two different types of assignments:

1. **MyMathLab Homework:** There will be about 10-20 homework problems for each section of the textbook. You will get three attempts to answer a question before MyMathLab will mark it incorrect. You can attempt a similar exercise for full credit. Therefore it is possible to receive 100% on each homework assignment. There are a number of learning aids available to help you solve the homework problems.
2. **MyMathLab Quizzes:** There will be weekly quizzes based on the current week's material as well as material from previous weeks. Quizzes will be untimed and do not need to be completed in one sitting. You will get only one attempt to answer each question, and you must complete the entire quiz before it is graded. The learning aids (e.g. Help Me Solve This and View an Example) that are available for the homework problems will not be available for the quizzes. Quizzes may be taken an unlimited number of times before the due date and only the highest grade will count.

You can request a 24-hour extension on any MyMathLab assignment without a penalty to your grade. I will not grant extensions beyond 24 hours.

Here is a suggested approach to online homework and quizzes based on feedback from previous students:

1. Obtain a three-ring binder and loose-leaf paper for notes.
2. Read the lecture notes and the ebook and write down the most important concepts.
3. Watch the videos associated with each section. Videos are located in the ebook and on my website at profsullivan.com. Take notes as you watch each video.
4. As you work through online problems, write down your steps in a clear manner. You may print each assignment if you prefer to work offline.
5. Ask questions by posting to the discussion board, sending an e-mail to the instructor, or attending office hours.
6. If you feel that you are getting overwhelmed, make an appointment for face-to-face tutoring at the ARC.

Online Tests: There will be four online tests. Online tests will be untimed and do not need to be completed in one sitting. The learning aids (e.g. Help Me Solve This and View an Example) that are available for the homework problems will not be available for each test. On some test problems, there will be an option to show your work. Although you will not be required to show your work, if you do, there may be the possibility of partial credit on questions that are marked incorrect. Partial credit will not be awarded under any circumstances if you do not show your work.

Online tests will be available one week before they are due.

Exams: There will be two proctored exams (the midterm and the final exam) which will be given at Massasoit's Brockton campus. For each exam you will have a choice of two sessions.

- Midterm Exam Sessions: Friday, March 23 or Saturday, March 24
- Final Exam Sessions: Friday, May 11 or Saturday, May 12

Please note that you will be required to show a photo ID upon taking the midterm and final exams.

If you are unable to attend the sessions at Massasoit's Brockton campus, arrangements for proctored examinations at other distance learning centers can be made. Possible local alternatives include the distance learning testing centers at Bridgewater State University and UMass-Boston. Alternative proctoring arrangements must be in place at least two weeks before the exam is scheduled.

You will be allowed to use one 8 1/2 x 11 sheet of notes (both sides) on the midterm and final exams.

Grading: Your course grade will be based on the following:

1. Online homework in MyMathLab (10%)
2. Online quizzes in MyMathLab (10%)
4. Online Tests: (30%)
5. Proctored midterm exam (25%)
6. Proctored final exam (25%)

above 92	A	80-82	B-	67-69	D+
90-92	A-	77-79	C+	63-66	D
87-89	B+	73-76	C	60-62	D-
83-86	B	70-72	C-	below 60	F

For course grades, I follow standard rounding procedures. Any percentage that ends in 0.5 or higher will be rounded up to the next percentage point. For example, if a student has a 79.5%, then that percentage will round up to an 80% or a "B-." That also means, however, if the number is 0.4 or less, then that percentage will be rounded down to the lower percentage point. For example, if a student earns a 79.4%, then that would round down to 79% or a "C+." As with any grading system, the cutoff points for the letter grades are arbitrary. That means that someone will always be close to getting the next letter grade.

The grade you earn is the grade you will receive in this course. Grades are not negotiable. You will not be allowed to make up work, substitute alternative assignments, or submit extra assignments in order to improve your grade during the semester or after the semester ends.

Extra Credit: There is no extra credit available in this class.

Incompletes: Grades of incomplete are given only in situations when extenuating circumstances such as an illness or a family emergency prevent a student from taking the final exam or fulfilling a specific requirement in the course. The grade of "I" cannot be used to give students additional time to complete course assignments in order to raise their grade.

Getting Help: There are several ways to get help during the semester.

1. You can contact me by email. I will answer all email within 24 hours (and usually much sooner).
2. You can post to the discussion board.
3. You can attend my office hours.
4. You can visit Massasoit's Academic Resource Center (ARC). The ARC provides tutoring at no cost. Tutoring is available by appointment or on a drop-in basis.

Accommodations Statement: Students with disabilities who believe that they may need accommodations in the classroom are encouraged to contact a disability counselor on campus as soon as possible. Students at the Brockton Campus with learning disabilities and all students at the Middleboro Center should contact Andrea Henry, at extension 1805. Students with physical disabilities at the Brockton Campus should contact Mary Berg, at extension 1425. All students at the Canton campus should contact Mary Berg at extension 2132.

Course Outline

The following is a **tentative** course outline. Changes may become necessary.

Appendix: Review

- A.1 Algebra Review
- A.2 Geometry Review
- A.3 Polynomials and Rational Expressions
- A.5 Solving Equations
- A.6 Complex Numbers; Quadratic Equations in the Complex Number System
- A.8 Interval Notation; Solving Inequalities
- A.9 n th Roots; Rational Exponents; Radical Equations

Online Test 1 (Sections A.1 – A.9): Due February 18

Chapter 1: Graphs

- 1.1 Rectangular Coordinates; Graphing Utilities
- 1.2 Graphs of Equations in Two Variables
- 1.3 Solving Equations in One Variable Using a Graphing Utility
- 1.4 Lines
- 1.5 Circles

Online Test 2 (Sections 1.1 – 1.5 and selected problems from previous sections): Due March 10

Midterm Exam (Sections A.1-A.9, 1.1-1.5): Friday, March 23 or Saturday, March 24

Chapter 2: Functions and Their Graphs

- 2.1 Functions
- 2.2 The Graph of a Function
- 2.3 Properties of Functions
- 4.1 Composite Functions
- 2.5 Library of Functions; Piecewise-Defined Functions
- 2.6 Graphing Techniques; Transformations

Online Test 3 (Sections 2.1 – 2.6, 4.1 and selected problems from previous sections): Due April 21

Chapter 3: Polynomial and Rational Functions

- 3.1 Quadratic Functions and Models
- 3.2 Polynomial Functions and Models
- 3.5 Polynomial and Rational Inequalities

Online Test 4 (Sections 3.1, 3.2, and 3.5 and selected problems from previous sections): Due May 7

Cumulative Multiple-Choice Final Exam (All sections): Friday, May 11 or Saturday, May 12

Course Outcomes

COURSE OUTCOMES	OUTCOMES ACTIVITIES
A student will be able to	
Use the built-in graphing capabilities of a graphing calculator in order to graph and analyze functions introduced in this course and in other mathematics and related courses.	<ol style="list-style-type: none"> 1. Graph functions. (CT,TS) 2. Adjust the graphing window to obtain a complete graph. (TS,CT) 3. Use ZOOM and TRACE appropriately. (TS,CT) 4. Use TABLE and TBLSET appropriately. (TS,CT) 5. Use other features such as 'zero', 'minimum', 'maximum', and 'intersect' appropriately. (TS,CT) 6. Use SOLVE appropriately. (TS,CT)
Perform operations on polynomials in order to have the skills necessary to analyze and solve problems involving polynomials and polynomial functions.	<ol style="list-style-type: none"> 1. Review addition, subtraction, and multiplication of polynomials. (CT,QS) 2. Divide polynomials, including polynomial long division. (CT,QS) 3. OPTIONAL: Divide polynomials using synthetic division. (CT,QS) 4. Solve polynomial equations and inequalities. (CT,QS) 5. Convert between interval notation, inequalities, and number line graphs. (CT,QS) 6. OPTIONAL: Apply the Remainder Theorem and the Rational Root Theorem. (CT,QS)
Apply formulas from analytic geometry and solve various types of equations in order to use these skills to solve related problems as they are introduced in this course and other mathematics and related courses.	<ol style="list-style-type: none"> 1. Solve absolute value equations and inequalities. (CT,QS) 2. Solve radical equations and rational exponent equations. (CT,QS) 3. Apply the distance formula. (CT,QS) 4. Apply the midpoint formula. (CT,QS)
Solve problems involving circles in order to apply the technique of completing the square and to demonstrate facility in transferring knowledge back and forth between graphical and analytical.	<ol style="list-style-type: none"> 1. Find an equation of a circle. (CT,QS) 2. Graph circles by hand and by using a graphing utility. (CT,QS, TS) 3. Find the center and radius of a circle given the equation in standard form. (CT,QS) 4. Find the center and radius of a circle given the equation in general form by completing the square. (CT,QS)
Demonstrate knowledge of the basic properties of functions in order to apply this knowledge to analyze and graph different types of functions as they are introduced in this course and other mathematics and related courses.	<ol style="list-style-type: none"> 1. Determine if a relation is a function. (CT,QS) 2. Find the domain and range of a function. (CT,QS) 3. Find the intercepts of a function algebraically. (CT,QS) 4. Determine if the graph of a function is symmetric with respect to the y-axis or the origin. (CT,QS) 5. Determine if the graph of an equation is symmetric with respect to the x-axis. (CT,QS) 6. Add, subtract, multiple, and divide functions and determine the domain of the resulting functions.

	<p>(CT,QS)</p> <p>7. Evaluate the difference quotient for polynomial and radical functions. (CT,QS)</p> <p>8. Evaluate the composition of functions. (CT,QS)</p> <p>9. Use the graph of a function to identify domain and range, intervals of increase and decrease, relative extrema, and intercepts. (CT,QS,TS)</p>
Analyze and graph polynomial functions (including linear and quadratic functions), absolute value functions, and radical and rational exponent functions in order to apply and expand upon these skills and knowledge in this course and other mathematics and related courses.	<p>1. Graph and identify the graphs of a basic library of functions including</p> <p>a. $y = K$,</p> <p>b. $y = x^n$,</p> <p>c. $y = \sqrt{x}$,</p> <p>d. $y = x$,</p> <p>e. $y = \lfloor x \rfloor$</p> <p>f. $y = \sqrt{r^2 - x^2}$. (CT,QS,TS)</p> <p>2. Use vertical and horizontal shifts, vertical and horizontal reflections, and vertical stretching and shrinking to graph functions. (CT,QS)</p> <p>3. Graph piecewise functions. (CT,QS)</p> <p>4. Graph and analyze the graphs of polynomial functions, absolute value functions, and radical and rational exponent functions. (CT,QS)</p> <p>5. Solve applied problems involving quadratic functions. (CT,QS,R)</p>
Solve problems involving complex numbers in order to apply these skills in this course and other mathematics and related courses.	<p>1. Add, subtract, multiply, and divide complex numbers. (CT,QS)</p> <p>2. Calculate powers of i. (CT,QS)</p> <p>3. Solve quadratic equations whose solutions are complex numbers. (CT,QS)</p>
To strengthen Core Competencies** in order to increase success in this and other courses and in the workplace.	Referenced above

**Indicate the Core Competencies that apply to the outcomes activities and assessment tools: Critical Thinking (CT); Technology Skills (TS); Oral Communications (OC); Quantitative Skills (QS); Reading (R); Writing (W).

Form DE-2

Distance Education Course Interaction Plan, Spring 2012

This form is to be completed by the faculty of record. Students enrolled in this distance education course shall receive a copy of this completed form.

Course Title: MATH203-E1 College Algebra (CRN 20993)

Faculty: Mary Sullivan

Telephone Number: 508-588-9100 ext 1653

Email Address: msullivan@massasoit.mass.edu

In-Person Office Hours:

- MWF: 9:00 – 10:00
- Th: 9:30 – 10:30

Virtual Office Hours: By appointment

Asynchronous Course

Synchronous Course

Asynchronous: This form of distance education is characterized by an emphasis on “learning on demand” or “as needed communication” between students and faculty from multiple locations at times convenient to participants.

Synchronous: This form of distance education entails the use of live, two-way communication among and/or between students and faculty in a scheduled or “fixed” point(s) of time(s), much like classroom-based instruction.

This course may include, but not be restricted to, the following interactions:

	YES	NO
1. in-person meetings	X	
2. telephone interactions	X	
3. electronic interactions (email, internet ...)	X	
4. web conferencing	X	

Students are required to engage in the following interaction(s) for successful completion of this course:

- Students are required to take two examinations on campus.
 - Midterm Exam Sessions: Friday, March 23 or Saturday, March 24
 - Final Exam Sessions: Friday, May 11 or Saturday, May 12
- Students are required to submit online homework assignments, quizzes and tests regularly throughout the semester. (See syllabus for further information.)
- Students are encouraged to communicate with me and/or with each other via email, discussion board, and web conferencing software.