



**MA-114 D01**  
**ALGEBRA and TRIGONOMETRY (4-0-4)**

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**Class Hours:**  
TH 2:50-4:50 pm  
**Office Hours:**  
MW 12:30-2:00 pm  
TH 11:00-1:00 pm, 2:30-2:50

**Course Description:** Algebra: basic operations on real and complex numbers, fractions, exponents and radicals. Determinants. Solution of linear, fractional, quadratic and system equations. Trigonometry: definition and identities, angular measurements, solving triangles, vectors, polar coordinates, graphs and logarithms.

**Prerequisite:** Acceptance based on placement test score.

**Textbook:** *Algebra and Trigonometry*, 6<sup>th</sup> Edition, by Larson and Hostetler; Houghton Mifflin, 2004

**Course Goals and Objectives:** The abbreviated goals for this course are:

1. To review real numbers and their properties, exponents and radicals, polynomials and special products, factoring, rational expressions and graphical representation of data.
2. To learn and understand equations and inequalities including graphs of equations, linear equations in one variable, modeling with linear equations, quadratic equations, complex numbers and linear inequalities in one variable
3. To learn and understand functions and their graphs including linear equations in two variables, functions, analyzing graphs of functions, shifting, reflecting, and stretching graphs and combinations of functions.
4. To learn and understand polynomial functions including quadratic functions, polynomial functions of higher degree, polynomial and synthetic division and zeros of polynomial functions.
5. To learn and understand exponential and logarithmic functions including exponential functions and their graphs, logarithmic functions and their graphs, properties of logarithms and exponential and logarithmic equations.
6. To learn and understand the basics of trigonometry including angles and their measure, right triangle trigonometry, trigonometric functions of any angle, graphs of sine and cosine functions, graphs of other trigonometric functions and inverse trigonometric functions.
7. To learn and understand the basics of analytic trigonometry including using fundamental identities, verifying trigonometric identities, solving trigonometric equations, sum and difference formulas, and multiple-angle and product-to-sum formulas.
8. To learn and understand the Law of Sines, the Law of Cosines and the trigonometric form of a complex number.
9. To learn and understand systems of equations including solving systems of equation, two-variable linear systems and multivariable linear systems.
10. To learn and understand matrices and determinants including matrices and systems of equations, operations with matrices, the inverse of a square matrix, the determinant of a square matrix and Cramer's Rule.

**Course Topics and Lecture Hours Devoted to Each Topic:**

1. Review of algebra. (9 class hours)
2. Equations and Inequalities. (9 class hours)
3. Functions and their graphs. (3 class hours)
4. Polynomial functions. (4 class hours)
5. Exponential and logarithmic functions. (8 class hours)
6. Trigonometry. (8 class hours)
7. Analytic trigonometry. (4 class hours)
8. Additional topics in trigonometry. (4 class hours)
9. Systems of equations. (6 class hours)
10. Matrices and determinants. (5 class hours)

**Laboratory Projects:** Not Applicable

**ABET Outcomes:**

- a. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines.
- b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.
- f. Ability to identify analyze and solve technical problems.

**Semester Grades:**

12 quizzes @ 25 pts. each (can drop 2)	250 points	A = 540-600 points
2 tests (100 pts each)	200 points	B = 480-539 points
Final Exam	150 points	C = 360-479 points
	----	D = 300-359 points
	600 points	F = 299 points (and below)

# MA-114 Algebra and Trigonometry

## Schedule:

Week/Date		Chapter/ Section	Topic/Event	Assignment
1	Jan 9	P.1	Review of Real Numbers and their properties Exponents and Radicals Polynomials and Special Products	p.9: 15,41,43,51,57,59,85,101,103,105 p 21: 5,9,11,15,21,29,31,33,39,41,43,55,59,61,65,67,79,81,85,89,91,97,101,103 p 29: 11,15,23,27,33,43,34,47,49,53,59,63,75
	Jan 11	P.2 P.3		
2	Jan 16	P.4	Factoring Quiz #1	p 38: 5,7,11,19,27,29,33,51,55,59,65,67,79
	Jan 18	P.5	Rational Expressions	p 48: 1,5,11,15,19,25,35,43,47,51,61
3	Jan 23	P.7	Graphical Representation of Data Quiz #2	p 64: 3,7,9,33,37,41 p 85: 1,9,49,51,57,59
	Jan 25	1.1 1.2	Graphs and Equations Linear Equations in One Variable	p 93: 1,3,21,23,25,31,49,59,61,63,81
4	Jan 30	1.4	Quadratic Equations Quiz #3	p 118: 3,7,9,11,15,21,25,35,37,67,69,73
	Feb 1	1.5	Complex Numbers	p 128: 1,5,9,17,19,21,27,29,37,41,49,53,63,65
5	Feb 6	1.6	Other Types of Equations Quiz #4	p 137: 1,7,15,29,33,57 p 147: 1,7,9,19,21,25
	Feb 8	1.7	Linear Inequalities in One Variable	
6	Feb 13	2.1	<b>TEST I</b>	p 181: 9,11,21,29,55,59,67,69,87,89; p195: 23,27,37,43,45,55
	Feb 15	2.2	Linear Equations in Two Variables Functions	
7	Feb 20	2.3	Analyzing Graphs of Functions Quiz #5	p 207: 1,15,17 p 216: 1,3,5
	Feb 22	2.4	A Library of Functions	
8	Feb 27	2.5	Shifting, Reflecting and Stretching Graphs Combinations of Functions	p 241: 1,5 p 234: 1,5,7,15,17 p 461: 5,7,9,11,29,31 p 472: 1,3,5,7,9,15,17
	Mar 1	6.1 6.2	Quiz #6 Angles and Their Measure Right Triangle Trigonometry	
9	Mar 4-11		<b>SPRING BREAK</b>	No Classes
10	Mar 13	6.3	Trigonometric Functions of Any Angle Graphs of Sine and Cosine Functions	p 484: 1,3,5,11,15,17,29,31 p 495: 1,3,9 p 506: 1,3,5
	Mar 15	6.4 6.5 6.6 6.7	Quiz #7 Graphs of Other Trigonometric Functions Inverse Trigonometric Functions Applications and Models	p 516: 1,3,17,21,27 p 526: 1,3,7,17
11	Mar 20	7.1	Using Fundamental Identities Verifying Trigonometric Identities	p 547: 1,5,17,27 p 555: 1,5,17,27,33,45 p 564: 1,7,11
	Mar 22	7.2 7.3 7.4 7.5	Solving Trigonometric Equations Quiz #8 Sum and Difference Formulas Multiple-Angle and Product-to-Sum Formulas	p 572: 1,7,9,15,23,31 p 582: 1,5,9,
12	Mar 27	8.1	<b>TEST II</b>	p 604: 1,5,15
	Mar 29	8.2 8.3 8.5	Law of Sines Law of Cosines	p 611: 1,5,9 p 624: 7,9 p 645: 11,15,35,37

13	Apr 3 Apr 5	9.1 9.2	Vectors in the Plane Trigonometric Form of a Complex Number Quiz #9 Solving Systems of Equations Two-Variable Linear Systems	p 671: 1,3,5,15,17 p 683: 1,11,15
14	Apr 10 Apr 12	9.3 10.1 10.2 10.3 10.4 10.5	Multivariable Linear Systems Matrices and Systems of Equations Operations with Matrices Quiz #10 The Inverse of a Square Matrix The Determinant of a Square Matrix Applications of Matrices and Determinants	p 742: 1,3,7,15,19,23,27,31 p 757: 1,5,7,15,23,27,29 p 767: 1,5,9,39,45 p 775: 1,5,11,25,31,37,61,75 p 787: 1,5
15	Apr 17 Apr 19	5.1 5.2 5.3 5.4 5.5	Exponential Functions and Their Graphs Logarithmic Functions and Their Graphs Quiz #11 Properties of Logarithms Exponential and Logarithmic Equations Exponential and Logarithmic Models	p 398: 1,3,5 p 404: 1,3,9,11,19  p 415: 1,9,17,27,39,43,53 p 424: 1,7,9,31,33,49 p 435: 1-6
16	Apr 24 Apr 26	3.1 3.2  3.3 3.4	Quadratic Functions Polynomial Functions of Higher Degree Quiz #12 Polynomial and Synthetic Division Zeros of Polynomial Functions	p 266: 1-8 p 280: 1-8 p 290: 5,7,19,21,49 p 303: 1,3,11
17	May 1 or 3		<b>FINAL EXAM</b>	

**NOTE: The last day to drop a course and receive the grade of "W" (withdraw) is March 27<sup>th</sup>.**

**Homework and Assignments:** The assignments listed in the schedule are to be regarded as homework for your attention immediately following the associated lesson. This should focus your attention on the type and degree of difficulty of questions you are expected to answer. A quiz during the next class period will be regarded as your response to the homework. If you need extra help and the instructor is not available, please go to the Tutoring Resource Center in the library. When the hours are set, a schedule will be posted around the campus.

**Attendance:** Regular attendance in this course, as in any mathematics course, is critical to thorough understanding of each concept and the continuity linking one concept to the next.

**Quizzes and Tests and Final:** There will be 12 quizzes (two can be dropped), two tests, and a final exam. There will be no make-ups for quizzes.

**Writing Requirements:** The ability to communicate ideas using established rules of the English language is an important outcome of everyone's technical education. In this course, you will be required to complete assignments for which writing is an important component, and attention to the grammar, spelling, and style of writing that you employ will have a significant impact on your grade in such assignments. You may seek help at the tutoring resource center to improve your writing abilities, should you feel that such help is necessary. You will find a writing guidelines posted at the following web address on school website:

<http://www.capitol-college.edu/resources/lib/writingguide/>

**Information Literacy:** Given the magnitude of information that we are expected to deal with in performance of our tasks, it is important to learn the proper ways of finding, retrieving, storing, processing and incorporating the right type of information. This course may include assignments that would require the use of on-campus and on-line libraries, the Internet or other sources of publicly available information.

**The "Incomplete" Grade:** There is occasionally a misunderstanding about "incompletes." College regulation specifies that an incomplete grade may be awarded only if the student has completed almost all the work for a course and has a valid, institution-approved, reason for being unable to complete it. If you are awarded an incomplete grade, it is your responsibility to complete all work for the course within the first 4 weeks of the next semester or summer term. After this time, the Registrar automatically converts the incomplete to an F.

**Academic Integrity:** It goes without saying that all work handed in for grading must be your own, but you must go further than this. Avoid situations that could compromise your integrity. For example, do not allow others to copy your work. If inclusion of another person's writings in your submitted work is appropriate, then proper credit should be given to the author of that writing. I will report any instance of suspected academic dishonesty to the appropriate committees of the school for further investigation and possible sanctions.

**Cell Phones, Pagers and iPods:** Cell phones, and pagers must be turned off when the student enters the classroom. Disruption of class by a cell phone or pager may lead to expulsion from the class. iPods in class will not be tolerated. Students with earphones and iPods will be asked to leave the classroom.