South Texas College
Department of Mathematics
==College Algebra Syllabus MATH 1414==

Instructor's Information:

Name of Instructor:	**Arnulfo A Ninal**
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Course Information:

Course Name:	College Algebra
Course #:	MATH 1414

Course Description:

This course is the study of quadratic, polynomial, rational, logarithmic and exponential functions. It includes systems of equations, sequence and series, matrices, determinants, and applications.

Prerequisite: A passing score of 68+ on the Elementary Algebra ACCUPLACER exam or 250+ on the math portion of the THEA test; "C" or better on MATH 0090; passing the college algebra placement exam, or exemption via SAT or ACT Scores.

Learning Outcomes:

Exemplary Educational Objectives:

➢ Apply arithmetic, algebraic, geometric, higher order thinking, and statistical methods to modeling and solving real-life situations;
➢ Represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically;
➢ Expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments;
➢ Use appropriate technology to enhance mathematical thinking and understanding and to solve mathematical problems and judge the reasonableness of the results;
➢ Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them;
➢ Recognize the limitations of mathematical and statistical models;

> ➢ Develop the view that mathematics is an evolving discipline, interrelated with human culture, and under stand its connections to other disciplines.

The objective of the Mathematics Component of the Core Curriculum is to develop a quantitatively literate college graduate. Every college graduate should be able to apply basic mathematical tools in the solution of real-life problems.

Intellectual Competencies:

A. Critical and Analytical Thinking:

- ➢ Demonstrate creative thinking, decision making, problems solving, visualization, and reasoning skills.
- ➢ Understand the problem and choose the right method(s) to solve for the unknown(s).
- ➢ Applying mathematics to real-life problems, and checking the logic of the solution.
- ➢ Recognize problems and devise and implement plan of action.
- ➢ Organize and relate symbols, pictures, graphs, objects, and other information.

B. READING:
- ➢ Analyze and interpret handouts, the textbook, and/or visual aids used during the semester.

C. WRITING:
- ➢ Develop, organize, draft, revise, and edit a research paper on math-related topic. List of the possible topics is attached.

D. SPEAKING:
Demonstrate effective oral communication techniques by engaging in discussions and presenting solutions answering questions from he students.

E. LISTENING:
Analyze and interpret various forms of spoken communication.

F. Technology:
Demonstrate knowledge of using the math computer software that accompanies the math textbook. Students will utilize scientific calculators and mathematics software to solve variety of problems.

Departmental Course Requirements:

- ➢ To provide quality academic education.
- ➢ Prepare students to succeed in other academic fields.
- ➢ Prepare students for upper level math related fields.
- ➢ Understand complex numbers and binomial theorem.
- ➢ Solve inequalities, and logarithmic, exponential and systems of equations and their applications. Also, be able to apply mathematical induction and deduction.

➤ Understand matrices, determinants, sequences, and series and their applications in real-life.
➤ Develop a prepared workforce.

Evaluation:

Evaluation method for exemplary educational objectives:
Data will be collected from common set of problems.
Grading Criteria

5 tests @.........100 points each (**Lowest score will be dropped**) Term Project.... 50 points Final Exam ......150 points (**Mandatory**) **Total Points....600 points**	A = > 90%.............(540-600) B = 80%-89%......(480-539) C = 70%-79%......(420-479) D = 60%-69%......(360-419) F = < 60%.............(<360)
All exams are in-class closed-book exams -- No Make-ups! **Use of cell phones, cell phone calculators, iPod, or electronics is** **not allowed during exams or class time.** **Check with the instructor for the kind of Calculator allowed**	

Required Textbook & Resources:

College Algebra – 10th Edition by Lial/Hornsby/Schneider

Tutors at the Math Learning Centers will be available to help students with their homework. Math computer software with guided examples and real-life application accompany the textbook. Students are asked to come to the board to present problems, discuss different techniques, and answer questions from instructor and other students. . The term project will address all the Exemplary Educational Objectives for the math core component. A list of the projects' topics is attached.

Possible topics for term paper and Guidelines:

Break-even Analysis (Business Application)
Depreciation (Various Methods)
Maximum Profit (Modeling)
Half-life of Radioactive Isotopes
Magnitude of Earthquakes
Radioactive Decay
Annuities
Mortgage Payments
Path of a Projectile
Binomial Theorem
Combinations of n elements taken r at a time
Conic Sections

Continuous Compounding of Interest
Cramer's Rule
Population Growth (Human, Animal, etc.)
Rene Descartes
Determinants
The number e
Carl Friedrich Gauss
Gauss-Jordan Elimination method
Geometric Sequences and Series
Horizontal Asymptotes
Hyperbolas
Wilhelm Jordan
Johannes Kepler

Linear Programming
Pascal's Triangle
Sigma Notation
Systems of Inequalities
Vertical, Horizontal and Slant
Asymptotes

Fibonacci Sequence
John Napier
Blaise Pascal
Niels Henrik Abel
Other Topical or Biographical Papers as
approved by the Instructor.

Biographical Paper should contain at least three bibliographical references.
Biographical Presentations should focus upon the mathematical contributions of the
individual along with other human-interest information about the individual.

Topical Papers should contain a general mathematical description of the topic.
Demonstrations about the topic are advisable. The presenter should understand the topic
thoroughly enough to respond to questions posed by students or the instructor.

Developmental Studies Policy Statement:
- Failure to remain in at least one Developmental Studies course for students who have not met the passing standard on an approved assessment instrument in reading, writing, and/or mathematics may result in the student's withdrawal from ALL college courses.
- All developmental courses including the College Success course will be included in the Semester Grade Point Average (GPA) for all students at STC.
- Students in Developmental Studies will be limited to a maximum of 13 credit hours of course work per semester and 7 credit hours per summer session.
- Students taking 12 or more credit hours per semester who have not met the passing standard on an approved assessment instrument will be required to take two or more developmental courses every semester if they are deficient in more than one academic skill (reading, writing, and mathematics).

Alternative Format Statement: This document is available in an alternative format upon request by calling 956-872-8327.

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Required Sections and Recommended Exercises:

Math 1414 - College Algebra

Prerequisite: *A passing score of 250+ on the math portion of the THEA exam, 68+ on the EA ACCUPLACER, passing the College Algebra Placement Exam, or passing MATH 0090 with "C" or better.*

Chapter 1	DESCRIPTION	Recommended Problems
1.3	Complex Numbers	1-34, Odd 35-95
1.4	Quadratic Equations	Odd 1-65, 73-78
1.5	Applications and modeling with Quad. Eqns	1-6, Odd 15 - 33
1.6	Other Types of Equations and Applications	Odd 1-49, Odd 69-85
1.7	Inequalities	Odd 1-43
1.8	Absolute Value Equations and Inequalities	1-34, Odd 35-91
	TEST - 1	
Chapter 2	**DESCRIPTION**	**Recommended Problems**
2.1	Rectangular Coordinates and Graphs	Odd 1-39
2.2	Circles	Odd 1-45
2.3	Functions	Odd 1-59
2.4	Linear Functions	1-10, Odd 11-57, 59-64
2.5	Equations of Lines	1-30, odd 33-49, 57,59,61
2.6	Graphs of Basic Functions	1-16, odd 17-53
2.7	Graphing Techniques	1-30, odd 31-59, 61-66
2.8	Function operations and composition	1-25, Odd 27-89
	TEST - 2	
Chapter 3	**DESCRIPTION**	**Recommended Problems**
3.1	Quadratic Functions and Models	1-20, Odd 21-55
3.2	Synthetic Division	1-10, Odd 11-45
3.3	Zero of Polynomial Functions	1-25, Odd 27-87
3.4	Polynomials Graphs, App.& Models	1-12, Odd 17-59, Odd 97 – 107
3.5	Rational Functions	1-16, Odd 17-33, Odd 37-67, 111, 113
	TEST -3	
Chapter 4	**DESCRIPTION**	**Recommended Problems**
4.1	Inverse Functions	Odd 1-25, 26-45, Odd 55-85
4.2	Exponential Functions	1-18, Odd 25-83
4.3	Logarithmic Functions	1-30, Odd 31-50, 51-56
4.4	Evaluating Logarithms	1-26, Odd 29-57
4.5	Exponential and Logarithmic Equations	Odd 1-55, Odd 59-65, Odd 71-83
4.6	Applications, Growth, and Decay	1-15, Odd 17-45
	TEST - 4	
Chapter 5	**DESCRIPTION**	**Recommended Problems**
5.1	Systems of Linear Equations	7-35, Odd 47-57, 69-71, 77-80
5.2 (*)	Matrix Solution of Linear Equations	1-20, Odd 27-45, Odd 53-63
5.3	Determinant Solutions of Linear Equations	1-28, Odd 35-55, odd 75-85
5.7	Properties of Matrices	1-35, Odd 37-59, 75-78, Odd 81-85
5.8	Matrix inverses	1-53 odd
7.1	Sequences and Series	1-12, Odd 23-69, 87, 89
7.2	Arithmetic Sequences and Series	Odd 1-61, Odd 69-75
7.3	Geometric Sequences and Series	Odd 1-33, 58-60, Odd 61-69
	TEST -5	
Departmental Comprehensive Final Exam		