**MTH 130**

**College Algebra**

**Spring 2017**

**Text and calculator**

College Algebra by Paul Sisson 2nd edition

Any scientific calculator at any level

**Instructor**

Dr. Clayton Brooks

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Office hours: MTWR 10:00 – 11:00, or by appointment

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Telephone: The University does not give me full telephone access so I may not be able to return your call. So, with that in mind, my number is ×6-6702.

**Course description**

College Algebra – 3 hrs.

Polynomials, rational, exponential, and logarithmic functions. Graphs, equations and inequalities, sequences. (PR: Math ACT 21 or above)

**Learner outcomes**

The student is expected to be able to:

* Learn the vocabulary and concepts used in studying equations
* Solve linear equations in one variable
* Solve rational equations with variables in the denominators
* Solve formulas for a specific variable
* Solve applied problems by using linear equations
* Learn procedures for solving applied problems
* Perform arithmetic with complex numbers
* Solve a quadratic equation by various methods
* Model situations with quadratic equations
* Solve equations by factoring
* Solve rational equations
* Solve equations with radicals
* Learn the vocabulary used with inequalities
* Solve and graph linear and compound inequalities
* Solve equations and inequalities involving absolute values
* Plot points in the Cartesian coordinate plane
* Find the distance and midpoint between two points
* Sketch graphs by plotting points
* Find intercepts and symmetries in graphs
* Find the equation of a circle
* Find the slope of a line
* Find the equation of a line in point-slope, slope-intercept, and general forms
* Recognize the equations of horizontal and vertical lines
* Find equations of parallel and perpendicular lines
* Use linear regression to model an application
* Define relation and function
* Determine the domain of a function
* Analyze properties of functions based upon their graphs
* Determine intervals of increase of a function, and its average rate of change
* Determine if a function is odd or even
* Graph basic functions
* Evaluate and graph piecewise-defined functions
* Graph algebraic transformations of known graphs
* Find arithmetic and composite combinations of functions
* Decompose a function into a composition
* Find and apply inverse functions
* Graph quadratic functions
* Model and solve problems using quadratic functions
* Solve equations of a quadratic form
* Determine zeros and end behavior of polynomial functions
* Determine the multiplicity of a zero of a polynomial function
* Perform long and synthetic division of polynomials
* Understand the concept of the Factor Theorem
* Examine all asymptotes of a rational function
* Solve polynomial and rational inequalities
* Sketch the graph of an exponential function
* Model problems involving compound interest
* Identify and apply the natural exponential function
* Define and apply basic properties of logarithms
* Graph and apply logarithmic functions
* Understand the relationship between exponential and logarithmic functions
* Solve exponential and logarithmic equations and their applications
* Model exponential, logarithmic, and logistic growth.
* Understand the nature of solutions to linear systems.
* Use graphing, substitution and elimination to solve linear systems.
* Model problems with linear systems.
* Use matrices to represent linear systems.
* Utilize technology to solve linear systems.
* Perform matrix arithmetic and its relation to applications.
* Become familiar with the use of an appropriate calculator

**Assessment of learner outcomes**

The student will be expected to:

* Answer questions that determine basic comprehension of concepts.
* Interpret results given data or graphs.
* Simplify expressions.
* Solve equations.
* Graph results or functions.
* Interpret results.
* Apply concepts to find solutions to a situation.

This will be demonstrated by the results of 3 in-class tests and a cumulative final exam.

The test will consist of a portion that does not allow a calculator or other technology, and a portion that will require a graphing calculator.

No sharing of calculators or other technology during a test is allowed.

**Grading policy**

The weights given to aspects of the class are:

300 points In-class tests

200 points Final exam

100 points max for all other quizzes and assignments

A letter grade, or its equivalent on a 90-80-70-60 scale, will be given for each aspect. The final grade will be an average of those aspects.

**Late penalties**

A penalty of 1% reduction for each hour late will be assessed for any assignment. Make-up tests will not be given for any unexcused absence.

**Attendance policy**

There is no formal attendance policy. However, being absent for exams and class presentations and discussions inherently carries potentially severe penalties.

**Course philosophy**

The basic idea is to provide the student with the algebraic tools needed to succeed with related duties in other subjects. Breadth, rather than depth, of the wide range of subjects will dictate the schedule for the semester.

**Teaching outline**

Week of:

January 10: Sections 1.1 – 1.3

January 17: Sections 1.4 – 1.6

January 24: Sections 2.1 – 2.3, quiz on chapter 1

January 31: Sections 2.4 – 2.6

February 7: **Test on February 9**

February 14: Sections 3.1 – 3.3

February 21: Sections 3.4 – 4.1

February 28: Sections 4.2 – 4.4, quiz on chapter 3

March 7: Sections 4.5, 4.6

March 14: **Test on March 16**

March 28: Sections 5.1, 5.2, 5.4

April 4: Sections 6.1, 7.1, 7.2

April 11: Sections 7.3 – 7.5

April 18: **Test on April 20**

April 25: Sections 8.1, 8.2

**The Final Exam is on Thursday, May 4, 12:45 – 2:45**