College Algebra
Austin Community College

Section          Spring 2013 / MATH-1314-014 / synonym 23793
Class meetings  MW 12 noon - 1:20 pm / NRG 2240

Instructor          Herb Ling
Office hours        MW 1:25 pm – 1:55 pm / NRG PB4
                      TTh 9:00 am – 9:40 am / NRG PB4
Web site           http://www.austincc.edu/herbling/algebra.html
E-mail             herbling@austincc.edu
Voice mail         223-1795, 22304#


Required tools    1-inch binder for course notes and homework
                  scientific calculator (Casio fx-300ES, TI-30XS, or similar model)

Grading           Each student's over-all course grade will be calculated as a weighted average as follows:
                  unit tests (4) 60%
                  daily grades  15%
                  final exam--cumulative 25%

                  Grades will be determined according to the scale below:
                  90 or above    A
                  80 to 89.9      B
                  70 to 79.9      C
                  60 to 69.9      D
                  below 60        F

COURSE DESCRIPTION
MATH 1314 COLLEGE ALGEBRA (3-3-0). A course designed for students majoring in business, 
mathematics, science, engineering, or certain engineering-related technical fields. Content includes the 
rational, real, and complex number systems; the study of functions including polynomial, rational, 
exponential, and logarithmic functions and related equations; inequalities; and systems of linear equations 
and determinants. Prerequisites: MATD 0390 or satisfactory score on the ACC Assessment Test. (MTH 1743)

COURSE PREREQUISITE
Intermediate Algebra (MATD 0390) or current knowledge of high school algebra as measured by the 
Assessment Test. Students who have a great deal of difficulty with the Pretest and/or review and have not 
had Intermediate Algebra or its equivalent recently should consider withdrawing and taking Intermediate 
Algebra.

INSTRUCTIONAL METHODOLOGY
This course is taught in the classroom primarily as a lecture/discussion course.
COURSE RATIONALE
This course is designed to teach students the functional approach to mathematical relationships that they will need for a business calculus sequence. Other courses, such as MATH 1332, or MATH 1342 are more appropriate to meet a general mathematics requirement. Check with your degree plan as to what math course your college requires.

COMMON COURSE OBJECTIVES
Functions:
* Use and interpret function notation.
* Find the domain of polynomial, rational, radical, exponential, and logarithmic functions.
* Find a symbolic representation of the sum, difference, product, quotient, and composition of two functions.
* Evaluate the sum, difference, product, quotient, and composition of two functions at a given value of the respective domain for functions represented symbolically, graphically, and numerically.
* Find the inverse of a function represented symbolically, graphically, or numerically.
* Interpret the graphs of functions.

Graphing functions:
* Sketch the graphs of the following: lines, \( x^2 \), \( x^3 \), \( x^{1/2} \), \( 1/x \), \( 1/x^2 \), \( |x| \), factored polynomials of degree 3 or more, \( a^x \), \( \log_a x \), and rigid transformations of these functions.
* Describe the end behavior of polynomial functions.
* Approximate zeros of a function from its graph.
* Solve an inequality involving a function from its graph.
* Find inverses of functions graphically.
* Graph a piecewise-defined function.

Symbolic Adeptness:
* Solve polynomial, rational, exponential, and logarithmic equations symbolically.
* Solve equations involving radicals symbolically.
* Solve equations with rational exponents symbolically.
* Solve equations with negative exponents symbolically.
* Solve polynomial and rational inequalities symbolically.
* Use the Fundamental Theorem of Algebra and the Conjugate Zeros Theorem to find zeros of polynomials of degree three or more.
* Find the vertex of a parabola and the center and radius of a circle by completing the square.
* Find the vertex of a parabola written in standard form by using the formula \( h = -b/2a \).
* Convert an exponential equation to logarithmic form, and a logarithmic equation to exponential form.
* Evaluate exponential and logarithmic functions using the change-of-base formula and a calculator.
* Use the properties of logarithms to expand a logarithmic expression, and to write an expanded logarithmic expression as a single logarithm.
* Solve a system of linear equations using Gaussian elimination.
* Solve a system of linear equations using matrix inversion or Cramer's Rule.

Applications
* Recognize and use applications of linear functions.
* Recognize and use applications of quadratic functions, including falling object problems and extremum problems.
* Recognize and use applications of exponential and logarithmic functions, including exponential growth and decay, doubling time, and half-life problems.
* Recognize and use applications of systems of linear equations.
COURSE CALENDAR (subject to change)

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<thead>
<tr>
<th>week of</th>
<th>topics</th>
<th>reading</th>
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<tbody>
<tr>
<td>Jan 14</td>
<td>“numeracy”; circles; functions; linear vs. nonlinear, rates</td>
<td>1.1, 1.2, 1.3, 1.4, 1.5</td>
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<td>Jan 21</td>
<td>HOLIDAY; linear functions, graphs, eqns; applications</td>
<td>2.1, 2.2, 2.3</td>
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<td>Jan 28</td>
<td>lin ineqs; abs val; Test 1 (Testing Center, by Sat, Feb 2)</td>
<td>2.4, 2.5</td>
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<td>Feb 4</td>
<td>quadratic models, equations, &amp; inequalities</td>
<td>3.1, 3.2, 3.3, 3.4</td>
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<td>Feb 11</td>
<td>graph transformations; combining functions; lin vs. exp</td>
<td>3.5, 5.1</td>
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<td>Feb 18</td>
<td>review; Test 2 (Wed, Feb 20)</td>
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<tr>
<td>Feb 25</td>
<td>exponential growth, compounding; inverse functions</td>
<td>5.3, 5.2</td>
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<td>Mar 4</td>
<td>logarithmic models; properties of logarithms</td>
<td>5.4, 5.5</td>
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<td>Mar 11</td>
<td>SPRING BREAK</td>
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<td>Mar 18</td>
<td>exponential and logarithmic equations; review</td>
<td>5.6</td>
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<td>Mar 25</td>
<td>review; Test 3 (Wed, Mar 27)</td>
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<tr>
<td>Apr 1</td>
<td>systems of linear eqns; matrices; Gaussian elimination</td>
<td>6.1, 6.2, 6.3, notes</td>
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<td>Apr 8</td>
<td>matrix algebra, matrix inverses; applications</td>
<td>6.4, 6.5, 6.6</td>
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<td>Apr 15</td>
<td>review; Test 4 (Wed, Apr 17)</td>
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<td>Apr 22</td>
<td>polynomial graphs; factoring</td>
<td>4.1, 4.2, 4.3, 4.4</td>
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<td>Apr 29</td>
<td>complex roots; polynomial, rational fns &amp; inequalities</td>
<td>4.5, 4.6, 4.7, 4.8</td>
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<td>May 6</td>
<td>Final Exam, (Mon, May 6 and Wed, May 8)</td>
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CLASS POLICIES

Tests  There will be no make-up tests. Each part may only be taken on the scheduled day. If any part is missed, that part earns zero (0) points.

Daily grades  Each class meeting you will earn a daily grade of up to 10 points. Usually, a quiz will be given containing problems and questions like those covered in the previous class and homework assignment. On some days, a homework spot check may count instead of a quiz. You must be in class during the quiz or homework check in order to earn the daily grade.

Withdrawal  If you are absent for 4 or more MW classes, your instructor is allowed to withdraw you from the course. April 22 (Mon) is the last day that a student may withdraw from this course. Any student enrolled in the course after that date must receive a letter grade.

Incomplete  Incomplete grades (I) will be given only in very rare circumstances. Generally, to receive a grade of "I", a student must have taken all examinations, be passing, and after the last date to withdraw, have a personal tragedy occur which prevents course completion.

ON-CAMPUS RESOURCES

Lab course  Sections of MATH 0153 (1-0-2) are sometimes offered. This lab class is designed for students currently registered in College Algebra (MATH 1314). It offers individualized and group setting to provide additional practice and explanation. This course is not for college-level credit. Repeatable up to two credit hours.

Tutoring  The Learning Lab (NRG 4119) provides free walk-in tutoring in many subjects, including math, reading, and writing. There is also a computer room with tutorial software for practice in basic skills. You can find detailed information about the learning labs on various campuses at http://www.austincc.edu/tutor/
Library The Library (NRG 1223) has books, DVDs, calculators, and laptops that can help you learn math and/or study more effectively. Most materials can be used in the library or checked out.

Computing The Computer Center (NRG 1203) across the hall from the library has Internet access and productivity software for student use. In particular, you can browse the class web page and view homework assignments at the computer center.

STATEMENT ON STUDENTS WITH DISABILITIES
Each ACC campus offers support services for students with documented physical or psychological disabilities. Students with disabilities must request reasonable accommodations through the Office of Students with Disabilities on the campus where they expect to take the majority of their classes. Students are encouraged to do this three weeks before the start of the semester.

Students who are requesting accommodation must provide the instructor with a letter of accommodation from the Office of Students with Disabilities (OSD) at the beginning of the semester. Accommodations can only be made after the instructor receives the letter of accommodation from OSD.

STATEMENT ON STUDENT DISCIPLINE
Classroom behavior should support and enhance learning. Behavior that disrupts the learning process will be dealt with appropriately, which may include having the student leave class for the rest of that day. In serious cases, disruptive behavior may lead to a student being withdrawn from the class. ACC's policy on student discipline can be found in the Student Handbook under Policies and Procedures or on the web at http://www.austincc.edu/handbook.

STATEMENT ON SCHOLASTIC DISHONESTY
Acts prohibited by the college for which discipline may be administered include scholastic dishonesty, including but not limited to, cheating on an exam or quiz, plagiarizing, and unauthorized collaboration with another in preparing outside work. Academic work submitted by students shall be the result of their thought, work, research or self-expression. Academic work is defined as, but not limited to, tests, quizzes, whether taken electronically or on paper; projects, either individual or group; classroom presentations; and homework.

STATEMENT ON SCHOLASTIC DISHONESTY PENALTY
Students who violate the rules concerning scholastic dishonesty will be assessed an academic penalty which the instructor determines is in keeping with the seriousness of the offense. This academic penalty may range from a grade penalty on the particular assignment to an overall grade penalty in the course, including possibly an F in the course. ACC's policy can be found in the Student Handbook under Policies and Procedures or on the web at http://www.austincc.edu/handbook

STATEMENT ON ACADEMIC FREEDOM
Institutions of higher education are conducted for the common good. The common good depends upon a search for truth and upon free expression. In this course the professor and students shall strive to protect free inquiry and the open exchange of facts, ideas, and opinions. Students are free to take exception to views offered in this course and to reserve judgment about debatable issues. Grades will not be affected by personal views. With this freedom comes the responsibility of civility and a respect for a diversity of ideas and opinions. This means that students must take turns speaking, listen to others speak without interruption, and refrain from name-calling or other personal attacks.
Your regular attendance and courteous participation are expected. In-class activities and discussions should be very helpful for most students. If you must miss a class, it is your responsibility to find out what material you missed and cover it outside of class.

Please be considerate. Before class begins, turn off cell phones or other devices that may disturb the class. If you must leave during class, slip out quietly. Listen carefully when anyone else is speaking. Learn patience. Support your classmates as they struggle to learn. This is a team effort.

You are more likely to do well if you have enough time and use good strategies. Learning anything takes time. For this course, you should spend at least 3 hours each week outside of class, reading, thinking about suggested problems, writing solutions, discussing concepts with each other, and reviewing. Many students may need more study time (6-10 hours a week).

Study “smart”. Work under conditions (light, sound, time of day, lack of distraction) that are best for you. Write neatly and organize your work. Every hour or so, take a five-minute break: get up, move around, get a drink of water. Look for patterns and connections. Smile!