Semester/year: Spring 2010
Instructor: Tom Atkin
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Office Location: Shields 207-A
Office Hours: 10:00 – 10:50 TR; noon – 12:50 F;
3:00 – 4:00 MW
Office Phone: 732-6807

Course Description: This is a single course equivalent to College Algebra (MATH 143) plus Trigonometry (MATH 144). Credit hours are not granted in both MATH 143 and MATH 147, nor in both MATH 144 and MATH 147. NOTE: For convenience of the student schedule, MATH 143 and MATH 144 may be taken concurrently in lieu of MATH 147.

Pre-requisites: MATH 108 with a grade of “C” or better, or COMPASS placement test score of 62 or higher on the algebra portion, or ACT Math score of 26 or higher.


Equipment: A graphing calculator is required. TI–83/84 will be used by the instructor. TI–89, TI–Nspire, and Casio–FX 115 ES will not be allowed.

Course Objectives: The student will have a strong understanding of the topics listed in the course content (below). This course will prepare students for Math 170 and other courses which have both college algebra and trigonometry as pre-requisites.

Outcomes Assessment: Quizzes and homework will be used to assess student achievement. Midterm exams will be used to assess mastery of course content. Students will complete a comprehensive final that will measure student’s knowledge of the material that was covered throughout the semester. Student’s quizzes, homework, midterm exams and final exam will determine if the student has met the required grade of C or better, to fulfill their program requirement or progress to the next math course in their sequence. Extra credit will generally not be given.

Methods: Textbook study, lectures and explanations from instructor, class discussion and help from the instructor outside of class are all methods used. It is hoped that the students will also form study groups and work to help each other progress.

Grading: Final course grades will be based on:

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<th>Component</th>
<th>Weight</th>
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<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Quizzes</td>
<td>30%</td>
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<tr>
<td>Midterm Exams</td>
<td>30%</td>
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<tr>
<td>Final Exam**</td>
<td>30%</td>
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The grading scale will be:

- 90 – 100%: A
- 80 – 89.9%: B
- 70 – 79.9%: C
- 60 – 69.9%: D
- < 60%: F

** In order to receive a grade of C or higher, the comprehensive final must be passed with a score of 60% or higher.
**Homework:** Homework will be assigned daily, though it will be collected randomly by rolling a die and choosing two numbers. If one of the numbers chosen comes up, the homework will be turned in. **It is the student’s responsibility to make sure the homework is done correctly.** Homework that is graded will be graded out of ten points that will be given for completion of the assignment. Late homework will not be accepted (except in extenuating circumstances). If you know you will be missing a class, it would be wise to hand in the assignment due that day before you leave, just in case.

**Quizzes:** To grade the content of the homework, there will be eleven quizzes of ten questions each that will come directly from assigned homework problems. The quizzes will be given in class on most Fridays. The lowest score will be dropped. Quiz dates are: Jan 22, Jan 29, Feb 5, Feb 19, Feb 26, Mar 5, Mar 26, Apr 2, Apr 9, Apr 23, and Apr 30.

**Exams:** There are three midterm exams taken in class on Fridays. Late tests will not be given (except in extenuating circumstances). Each midterm will be worth 100 points. Test dates are Feb 12, Mar 12 and Apr 16.

**The final exam will be comprehensive and will be given in the classroom on Wednesday, May 12, at noon.**

**CSI E-mail:** Students must check their CSI e-mail accounts regularly to avoid missing important messages and deadlines. At the beginning of each semester free training sessions are offered to students who need help in using their accounts. Any student that replies to the email I sent today by tomorrow will receive five (5) bonus points towards their semester grade.

**Course Evaluation:** To help instructors continually improve courses, students are strongly encouraged to complete anonymous evaluations which open two weeks before the end of the course and close the last day of class. Evaluations are available online at: http://evaluation.csi.edu. I will give any student that completes the evaluation five (5) points towards their semester grade.

**Attendance Policy:** Students who come to class regularly, are on time and prepared for class tend to do better in the course. I will not require attendance, but note that in general I do not accept late work. It is your responsibility to make arrangements with me when you miss class. In the case of an emergency or unforeseen illness, I will be much more able to work with you if I find out as soon as possible (e-mail is a great way to get me) what has happened to you. If less than 20% of the currently enrolled students come on a particular day, those attending will receive five (5) bonus points towards their semester grade.

**Academic Honesty:** Refer to school catalog (Pages 34-35) for the CSI student code of conduct. I value honesty and integrity in the classroom and expect all students to behave in an honest manner. We will continue to discuss matters of honesty through the semester and how it relates to collaboration and exams.

**Drop Policy:** It is the student’s responsibility to drop the course.

During the first two weeks of the term, a student may drop a course or completely withdraw without its being recorded on the student's official transcript. After the first two weeks a “W” will be recorded in any course the student drops.

A student desiring to drop a course during the first two weeks of the term may do so on-line. In order to drop or completely withdraw after the first two weeks, the student must complete and submit a drop or complete withdrawal form to the Admissions and Records Office.

**NOTE:** No course may be dropped or withdrawn from after 75% of the course or twelve weeks of the term has elapsed, whichever is earlier.
**DVD’s:** The Precalculus course has two complete sets of CD-ROMs. The CD-ROMs are located in the library and may be checked out overnight.

**Help Sessions:** The math lab will post hours of operation starting at the beginning of the second week of school. These sessions are in the CSI math lab (Shields 207L).

**Disabilities:** Any student with a documented disability may be eligible for related accommodations. To determine eligibility and secure services, students should contact the coordinator of Disability Services at their first opportunity after registration for a class. Student Disability Services is located on the second floor of the Taylor Building on the Twin Falls Campus or can be reached at 208.732.6250 (voice) or 208.734.9929 (TTY).

**Free Advice:** You can expect me to be on time to class prepared to provide you with the tools to complete this course. I expect you to provide a learning environment for the others in the class. Disruptive behavior (cell phones, loud talking, hostility, etc.) will not be tolerated. This is a class where a lot of information is covered, and the material tends to build on itself. If you do not master the early material, it makes everything much more difficult later on. The best thing you can do to do well in the class is to religiously do your homework. Because of that, I will not do much of the homework in class. If you need extra help, it is available. Between me and the Math Lab, there is someone who can assist you with your questions. Do not allow yourself to become hopelessly behind. Also, do not wait until April (or February) to find out what you need to do to get a “B” or a “C” or whatever. Be proactive! Act early and it will pay great dividends.

**Course Content:** Students will demonstrate a working knowledge of the following processes and concepts:

a. **Linear equations** (solve all types, simple to complex, model data and solve application problems)

b. **Formulas** (solve problems using formulas, isolate a specified variable)

c. **Quadratic equations** (solve by factoring, by taking square roots, by completing the square, using the quadratic formula, solve application problems)

d. **Solve other types of equations** (polynomial, radical, absolute value, equations that are quadratic in form, equations with rational exponents)

e. **Inequalities with one variable** (graph and solve linear, compound, absolute value, quadratic and rational inequalities)

f. **Lines** (find slope, graph, write equation, model data, use idea of parallel and perpendicular)

g. **Circles** (equation, center, radius, graph, convert equation to standard form)

h. **Functions** (definition, domain, range, use vertical line test, evaluate, intervals for increasing and decreasing, odd, even, symmetry, model data)

i. **Graph and analyze common functions** (quadratic, cubic, square root, absolute value, step, greatest integer)

j. **Transformations and combinations of functions** (vertical shifts, horizontal shifts, reflections, vertical stretching and shrinking, add, subtract, multiply, divide, composition, inverse)

k. **Quadratic functions** (graph, standard form, vertex, intercepts, model data, solve application problems)

l. **Polynomial functions** (end behavior, leading coefficient test, graph, Remainder Theorem, Factor Theorem, find all zeros)

m. **Rational functions** (vertical asymptotes, horizontal asymptotes, slant asymptotes, intercepts, graph, solve application problems)

n. **Variations** (direct, inverse, joint, combined)

o. **Exponential functions and equations** (evaluate, graph, transform, solve equations, model data and solve application problems)

p. **Logarithmic functions and equations** (log notation, properties of logs, evaluate, graph, solve log equations, change bases, model data and solve application problems)
q. **Systems of equations** (linear equations in two variables, linear equations in three variables, nonlinear equations in two variables, application problems)

r. **Systems of inequalities** (linear, nonlinear, linear programming)

s. **Conic sections** (analyze and graph ellipses, hyperbolas and parabolas, find vertices, foci, axis of symmetry, directrix, eccentricity and asymptotes as applicable, model data and solve application problems)

t. **Binomial theorem** (expand binomial raised to a power, find one specified term)

u. **Angles** (standard position, positive angle, negative angle, degree measure in degrees-minutes-seconds as well as decimal degrees, radian measure, coterminal angles, reference angles, supplementary, complementary)

v. **Trig functions in right triangles** (trig function definitions using opposite side, adjacent side and hypotenuse of right triangle; exact trig values of 30°-60°-90° and 45°-45°-90° triangles; use calculator to evaluate trig function values in degrees and radians; solve right triangles including application problems)

w. **Trig functions of any angle** (use the x-y-r definitions to find trig function values, signs of the trig functions within each quadrant, find and use reference angles)

x. **Trig functions of real numbers** (use the unit circle to find trig function values, properties of the trig functions (domain, range, symmetries, period)

y. **Basic trig identities** (Reciprocal, Quotient or Ratio, Pythagorean, rearrange basic identities, simplify trig expressions)

z. **Graph the trig functions** (period, amplitude, graph sin, cos, tan, cot, csc and sec functions without the use of a graphing calculator and using a graphing calculator, transformations of the basic trig graphs (horizontal and vertical shifts, vertical stretch/shrink, change of period, graph using addition of ordinates, given the graph of a trig function write the equation)

aa. **Inverse trig functions** (restrictions on the domain and range, how graph of inverse is related to trig function graph, find exact values using triangles, evaluate composition of a trig function and an inverse trig function, evaluate inverse trig functions using a calculator)

bb. **Verify trig identities** (include techniques of changing all to sin and cos, factoring, multiplying by a conjugate, etc., use graphs to decide if a given equation is an identity, then prove algebraically)

c. **Use trig identities** (Sum and Difference Identities for sin, cos, tan, Cofunction Identities, Double-Angle Identities, Half-Angle Identities, Product to Sum Identities, Sum to Product Identities)

dd. **Solve trig equations**

e. **Applications of trig** (Linear velocity, angular velocity, arc length, area of a sector, Law of Sines, Law of Cosines, area of a triangle, trigonometric form of complex numbers (compute absolute value, product, quotient), DeMoivre’s Theorem)

ff. **Parametric equations** (eliminate the parameter, graph)

gg. **Polar coordinates and equations** (convert to and from rectangular form, graph)

These additional topics will be covered as time allows:

a. Cramer’s Rule to solve a system of linear equations

b. Partial fraction decomposition

c. Matrix operations

d. Algebraic operations on vectors

e. Geometric interpretation of vectors

f. Polar equations of conics

**HOMEWORK SCHEDULE-147**

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