Instructor:

Gigi Drent
Office: Faculty One, Room 115
Office Hours: MW 10:00 – 10:50 or by appointment
Phone: 808-245-8289
Email: gdrent@hawaii.edu (best way to contact me)

Course:

MATH 140X, 4 CREDITS (3 lecture and 1 lab)
Class Time: MW @ 1:30 – 2:45
Class Location: NSCI 110

Prereq:

C or higher in MATH 103, or acceptable placement test score.

Description:

Students in this course study the operations with, the inverse of, and the multiple representations of functions, including but not limited to linear; quadratic; polynomial; rational; exponential; and logarithmic. Appropriate use of technology is incorporated to enhance the conceptual understanding of mathematics. This course is recommended to students who pursuing further studies in business,engineering, mathematics and/or sciences.

Learning Outcomes:

1. Use numerical, graphical, symbolic, and verbal representations of functions to solve problems and communicate with others.
2. Recognize, quantify and extend given patterns,
3. Generate proofs using mathematical and logical reasoning techniques, and

Text:

Algebra & Trigonometry by Michael Sullivan, Prentice Hall, 9th edition.
We will cover Chapters 1 – 6 and 12. And, MyMathLab Access Code.

Material:

An organized notebook, a graphing calculator, lots of paper and pencils!

Instruction:

You will be assigned into groups of four to go over homework, in-class practice, and to discuss challenging problems. You are expected to participate throughout class lectures/discussions. A good sign of understanding is to be able to explain the concept to someone. You are expected to do that throughout the semester. Remember that you are in charge of your own learning. The instructor can help greatly, but the ATTITUDE, the ENERGY, the AMBITION, the DETERMINATION, and the QUESTIONS must come from you!

Grading:

Your grade will be based on Homework Assignments (15%), Quizzes (15%) and Exams (60%), Show Me Math! (10%). There will be absolutely **no make-up**. Up-to-date assignment calendar is posted on MyMathLab. Late penalty applies for assignments done after the due date.

Grading Scale: 90 – 100%   A
                   80 – 89.99%   B
                   70 – 79.99%   C
                   60 – 69.99%   D
                   Below 60%   F

Remember that the last day of erase period is September 10th, 2012 and last day for a **withdrawal ("W") grade** is October 29th, 2012. Any changes after this date will require the instructor's signature and is given only in cases of extreme or unusual circumstances: 1) a certified medical reason or 2) a death in the immediate family.

An **incomplete ("I") grade** will be given only to students who are achieving passing grades and are very close to completing the course. The request form needs to be presented prior to the last day of instruction. In addition, the student must have a very good reason for not being able to complete all the work on time, such as those listed under withdrawal policy.

As members of the academic community students are expected to promote an atmosphere of honesty and learning, respect for others, and appropriate classroom behavior to maintain the academic integrity essential to the educational process. "**Academic dishonesty** cannot be condoned by the University. Such dishonesty includes cheating and plagiarism which violate the Student Conduct Code and may result in expulsion from the University." (Kauai Community College 2012/2013 Catalog)

Students with Disability: If you have a disability and have not voluntarily disclosed the nature of your disability and the support that you need, you are invited to contact the Counseling and Advising Office, 245-8212 as soon as possible. This is to ensure that such accommodations are implemented in a timely fashion.

Study Habits: You are expected to read the book before you came class. You are expected to complete your homework before the next class meeting. For each in-class hour, you are expected to spend at least two hours outside of class studying. If you have any question or if you are behind, let me know right away. Don't wait! You can get help from me during class, during my office hours or by appointment. You can also get help from a tutor at the **Learning Resource Center**.

Attendance: Attendance is essential to the success of this course. In each class period, new concepts are presented which build upon the concepts previously learned. These concepts, in turn, lay the foundation for what will be presented later. Your absence is not an excuse for your unawareness of the progress and activities of the class. Drop me a line via email or phone to let me know if you are going to be absent so I don't wonder where you are!

Course Contents:

I.   Basic Concepts (1 WEEK = 6 HOURS)

    1. Functions and Properties
        a.   Definition of Function, Vertical Line Test
        b.   Domain and Range
        c.   Intercepts
        d.   Even and Odd Functions
        e.   One-to-One
    2. Combinations of functions
        a. Sum, difference, product, quotient, composite
        b. The identity function
        c. The inverse function

II.   Linear (2 WEEKS = 12 HOURS)

    1. Solve linear equations in one variable
    2. Solve linear absolute value equations
    3. Graph <u>linear</u> functions
        a.   Slope
        b.   Intercepts
        c.   Parallel
        d.   Perpendicular
        e.   Modeling linear functions
            •   Find an equation of a line given sufficient information
            •   Linear regression
        f.   General form to slope-intercept form and vice versa
        g.   Properties of linear functions
        h.   Graphing linear piece-wise functions
    4. Graph <u>linear absolute value</u> function
        a.   Graph the absolute value of a linear function
        b.   Investigate transformations of linear absolute value functions
        c.   Graph linear absolute value using transformations
        d.   Properties of linear absolute values functions
    5. The inverse of a linear function
    6. Solve linear inequalities algebraically and graphically
    7. Solve systems of linear equations involving two variables algebraically and graphically

EXAM 1 – 09/19/12

III. Quadratic   (2.5 WEEKS = 15 HOURS)

1. Factoring quadratics
2. Solve factorable quadratics and polynomials
3. Graph factorable quadratics and polynomials
4. Reducing square-roots
5. Definition of the imaginary unit
6. Solve quadratic equations by completing the square
7. Derive and apply the quadratic formula
8. Graph quadratic functions using completing the square and transformations
9. Properties of quadratic functions
10. The inverse of a quadratic function
11. Graph the absolute value of quadratic and factorable polynomials
12. Solve quadratic inequalities algebraically and graphically
13. Modeling quadratics
    a. System of linear equations involving three
    b. Find an equation of a quadratic given sufficient information

IV. Polynomial   (2.5 WEEKS = 15 HOURS)

1. Operations with polynomials
2. Add, subtract, multiply complex numbers
3. Solve polynomial equations by applying the Rational Root Theorem and operations with polynomials
4. Graph non-factorable polynomial functions with the aide of a graphing calculator
5. Graph the absolute value of polynomial functions
6. Properties of polynomial functions
7. Solve polynomial inequalities algebraically and graphically
8. Modeling polynomials

EXAM 2 – 10/11/12

V. Rational   (2 WEEKS = 12 HOURS)

1. Operations with rational expressions
2. Divide complex numbers
3. Solve rational equations
4. Graph rational functions
5. Properties of rational functions
6. The inverse of a rational function
7. Graph the absolute value of rational functions

VI.   Radical   (2 WEEKS = 12 HOURS)

1.   Operations with radicals
2.   Solve radical equations
3.   Solve rational exponent equations
4.   Graph radical functions by transformation
5.   Graph the absolute value of radical functions
6.   Properties of radical functions
7.   The inverse of a radical function
8.   Solve radical inequalities algebraically and graphically

EXAM 3 – 11/8/12

VII.   Exponential/Logarithm   (3 WEEKS = 15 HOURS)

1. Properties of Exponents
   a. Properties of exponents
   b. Applying properties of exponents to do operations with scientific notation
2. Graphing exponential functions
   a.   Graphing the functions "as is" using transformations
   b.   Change the functions by applying the properties of exponents to make the connections between different transformations
3. Properties of exponential functions
4. The inverse of an exponential function
5. Graphing logarithms
   a.   Graphing the functions "as is" using transformations
   b.   Change the functions by applying the properties of logarithms to make the connections between different transformations
6. Properties of logarithms
7. Solving exponential and logarithmic equations algebraically and graphically
8. Modeling exponential and logarithmic functions

FINAL EXAM – CHECK FINAL SCHEDULE FOR EXACT TIME AND DATE!