

**UNIVERSIDAD DEL SAGRADO CORAZON
DEPARTAMENTO DE CIENCIAS NATURALES
SANTURCE, PUERTO RICO**

TITLE	: FUNDAMENTAL MATHEMATICS I and II
CODE	: MAT 108
CREDITS/HOURS	: FIVE CREDITS. 5 HOURS WEEKLY. ONE SEMESTER
PRE-REQUISITE	: CEEB BELOW 650

Description:

Sets, set of real numbers and their properties. Properties of exponents. Addition, subtraction, multiplication and division of polynomials and rational expressions. Radicals. Linear equations and inequalities. Complex numbers. Equations and inequalities with absolute value. Linear, quadratic, exponential and logarithmic functions. Systems of linear equations. Sequences.

Rational

Students who pursue a career in science or business administration should have an understanding of the basic principles of algebra.

Objectives:

Upon completing MAT 108, the student should:

1. Use the properties of real numbers and perform operations with real numbers.
2. Add, subtract, multiply and divide polynomials and rational expressions.
3. Evaluate exponential expressions.
4. Use different methods to factor polynomials.
5. Solve linear equations and inequalities in one variable.
6. Solve word problems.

7. Plot points in a Cartesian Coordinate System. Find the distance and midpoint between two points.
8. Distinguish between a relation and a function no matter if it is a graph, equation or coordinate points.
9. Identify the characteristics and graph a linear or quadratic function.
10. Solve quadratic equations.
11. Identify exponential and logarithmic functions.
12. Solve exponential and logarithmic equations.
13. Add, subtract, multiply and divide complex numbers.
14. Define a sequence. Identify arithmetic and geometry sequences.
15. Solve systems of linear equations in two variables.

Content::

- I. Sets and real numbers
 - A. Definitions and operations with sets
 - B. Graph and intervals in the real line
 - C. Properties and operations with real numbers
- II. Algebraic operations
 - A. Basic properties of exponents
 - B. Definition and operations with polynomials
 - C. Factoring polynomials
 - D. Operations with rational expressions
- III. Linear equations and inequalities
 - A. Solution of linear equations and problem solving.

- B. Solution of linear inequalities. Graphs and intervals.
- C. Solution of equations and inequalities with absolute value.

IV. Exponents

- A. Negative and rational exponents
- B. Definition, simplification and operations with radicals.

V. Cartesian Coordinate System

- A. Plot points
- B. Distance formula
- C. Midpoint

VI. Relations and Functions

- A. Definitions
- B. Draw graphs
- C. Recognize the function of a graph

VII. Linear and quadratic functions

- A. Draw graphs
- B. Intercepts
- C. Slope
- D. Parallel and perpendicular lines
- E. Quadratic equation
 - 1. Solving quadratic equations by factoring
 - 2. Solving quadratic equations by completing the square
 - 3. Solving quadratic equations by the quadratic formula

- F. Find the vertex of a parabola
- G. Word problems

VIII. Exponential and logarithmic functions

- A. Domain and range
- B. Draw graphs
- C. Solve exponential and logarithmic equations

IX. Systems of equations

- A. Solving systems of linear equations in two variables
 - 1. Elimination method
 - 2. Substitution method

X. Complex numbers

- A. Basic operations

Instructional strategies/Activities:

Lectures, presentations and discussion of math problems. Participation of students is encouraged. At the beginning of each class, the professor will explain material that was not understood.

Evaluation

Students will be evaluated using the traditional system of letters from A to F.

4 partial tests 75%
Final test 25%

Resources:

- 1. Blackboard
- 2. Calculator
- 3. Text exercises

Text

Angel, A. (2000). *Intermediate Algebra*, (9th edition). Prentice Hall

References

Word Problems modules for MAT 101 and 102 prepared by Prof. Carmen Padial. 1992.

Angel, A. (1996). *Intermediate Algebra*, (4th edition). Prentice Hall

Barnett, R. (2006). *Algebra* (11th Edition). Mc Gran-Hill

Dugopolski, M, (2000). *Intermediate Algebra*, (5th edition). McGraw Hill

Fraser W. R. (1993). *Intermediate Algebra* PWS Publishing Company

Kaufmann J. E. (1996). *Intermediate Algebra* (5th edition). PWS Publishing Company

Lial, M.& Hornsby, J. (2000). *Intermediate Algebra* (8th edition). Addison Wesley

Spiegel, M. S; Moyer, R. (2004). *Algebra*, Mc Graw-Hill

Streeter J., Hutchinson D. and Hoezle L. (1993) *Intermediate Algebra*. McGraw-Hill

Weltman, D. & Perez G. (1994). *Intermediate Algebra* (3rd edition). PWS Publishing Company

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- enter the address <http://biblioteca.sagrado.edu/>,
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ELECTRONIC ADDRESSES

www.slideshare.net/awrigame/resolver-ecuacion-lineal.htm

www.youtube.com/watch?v=kgl:nthj4vo

www.geocities.com/jrvengador/alebrlineal/sieclnl.html

www.investigacion-operaciones.com/solucion-grafica.htm

www.giocities.com/jrvengador/algebraalineal/sieclin1.html
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REASONABLE ACCOMODATION

Any student who needs reasonable accommodation should request the Associate Dean of Student Affairs.

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