Math 135 – College Now Syllabus

SMSU Course Title: PreCalculus
SMSU Faculty Mentor: Sherwin Skar
High School: Medford
High School Teacher: Mr. Werk
Semester and Year: 2015-16

Text : Ron Larson, (2014), Precalculus, 9th Edition, Brooks and Cole.

Course Description:

A detailed study of the mathematics needed for calculus. Concepts are presented and explored from symbolic, graphical, and numerical perspectives. Basic concepts covered include polynomial, rational, exponential, logarithmic, and trigonometric functions, complex numbers, linear systems, numerical patterns, sequences and series. The required preparation is Math 110 or three years of high school mathematics, including two years of algebra.

Learning Outcomes:

Upon completion of this course students will:

1. Be able to set up and solve algebraic, logarithmic, exponential, and trigonometric equations.
2. Be able to graph algebraic, logarithmic, exponential and trigonometric functions and interpret said graphs.
3. Be able to prove algebraic and trigonometric identities and read said proofs.
4. Be able to solve linear and nonlinear systems.
5. Be able to read, understand and work with sequences and series.

Minnesota Transfer Curriculum Goal 04 – Mathematical/Logical Reasoning:

1. Illustrate historical and contemporary applications of mathematical/logical systems.
2. Clearly express mathematical/logical ideas in writing.
3. Explain what constitutes a valid mathematical/logical argument (proof).
4. Apply higher-order problem solving and/or modeling strategies.

Prerequisites:

In order to be ready for the content of this course, students should have previously covered the following topics.

a. Real Numbers
b. Exponents and Radicals
c. Polynomials and Factoring
d. Rational Expressions
e. Coordinate Systems

Major Content Areas:

1. Equations and Inequalities
   a. Linear Equations, Graphs, and Applications
   b. Quadratic Equations and Applications
   c. Complex Numbers
   d. Other Types of Equations

e. Inequalities

2. Functions and Graphs
    a. Functions
    b. Graphs of Functions
    c. Parent Functions
    d. Transformation of Functions
    e. Composite and Inverse Functions

3. Polynomial Functions
    a. Quadratic Functions
    b. Higher Order Polynomial Functions
    c. Division of Polynomials
    d. Zero of Polynomials
    e. Applications

4. Rational Functions
    a. Rational Functions and Asymptotes
    b. Graphs of Rational Functions

5. Exponential and Logarithmic Functions
    a. Exponential Functions and Graphs
    b. Logarithmic Functions and Graphs
    c. Properties of Logarithms
    d. Exponential and Logarithmic Equations and Applications

6. Trigonometry
    a. Degree and Radian Measures
    b. Definitions of the Trigonometric Functions
    c. Standard Trigonometric Identities (Recognition, Use, and Proof)
    d. Graphs of Trigonometric Functions
    e. Inverse Trigonometric Functions
    f. Law of Sines
    g. Law of Cosines
    h. Heron's Area Formula
    i. Applications of Trigonometry to Real-Life Problems

7. Systems of Equations and Matrices
    a. Linear and Nonlinear Systems of Equations
    b. Two Variable Linear Systems
    c. Multivariable Linear Systems
    d. Applications of Systems to Real-Life Problems

8. Sequences and Series
    a. Sequence and Series Notation
    b. Factorials

c. Summations
d. Arithmetic and Geometric Sequences
e. Infinite Sums

9. Additional Topics if Time Permits
   a. Matrices
   b. Solving Linear Systems using Matrices
   c. Elementary Matrix Row Operations
   d. Gaussian and Gauss-Jordan Elimination
   e. Determinants and Cramer's Rule
   f. Inverse of Matrices
   g. Vectors
   h. Polar Coordinates
   i. Conic Sections

Grades: Final grades will be bases on the following percentages

Homework, attendance, and participation……..15%
Quizzes, test, and final exam……..85%