Master Syllabus

**Camden County College**

**Blackwood, NJ 08012**

**Course Title**: Accelerated Precalculus

**Course Number:** MTH-125

**Dept/Program Affiliation:** Mathematics

**Date of Review: 11/2018**

(This Department Master Syllabus has been examined by the program/department faculty members and it is decided that no revision is necessary at this time.)

**Date of Last Revision**: **11/2018**

(This Department Master Syllabus has been examined by the program/department faculty members and it is decided a change requiring a revision is necessary at this time.)

**N.B.** A change to the course materials alone (textbooks and/or supplementary materials) may not constitute a revision. Any other change to the items listed below on this form is considered a revision and requires approval by the program faculty at a Program/Department Meeting and by the division at a Chairs and Coordinator Meeting.

**Credits:**  **4**

**Contact Hours: Lecture** **4** **Lab** 0  **Other**

**Prerequisites:** Students must have earned an "A" in MTH-100 **OR** PROPER MATHEMATICS PLACEMENT EXAM SCORE **AND** ENG-013 (Reading Skills III) **OR** proper English placement exam score.

**Corequisites:** None

**Course Description:**

This is a **fast-paced**, rigorous precalculus course designed for science, technology, engineering, and mathematics majors. Topics include algebraic equations; functions; graphing; and exponential, logarithmic, and trigonometric functions; vectors and the complex plane; sequences, series, and limits. Students are required to have a calculator in their possession for all class meetings and are encouraged to purchase a TI-83/84 calculator. STUDENTS WHO FAIL TO MEET THE MATHEMATICS PREREQUISITE MUST REGISTER FOR THE TWO SEMESTER SEQUENCE--MTH-123 & MTH-124.

**Course Student Learning Outcomes:** (Cognitive, Psychomotor, Affective Domains)

At the end of this course the student will be able to:

* recognize and recall algebraic, exponential, logarithmic, and trigonometric formulas and identities to draw out factual answers, as assessed by tests, quizzes, homework, or projects.
* perform computations involving complex numbers, finding complex roots of polynomials, and stating the relationship between the subsets of the complex numbers, as assessed by tests, quizzes, homework, or projects.
* describe real world situations through the formulation of mathematical models, and use these models to extrapolate or predict future behavior, as assessed by tests, quizzes, homework, or projects.
* use a graphing calculator sketch, translate, and interpret graphs of linear, polynomial, rational, absolute value, *n*th root, exponential, logarithmic, and trigonometric functions, as assessed by tests, quizzes, homework, or projects.
* incorporate a wide variety of manipulations to solve linear, polynomial, rational, absolute value, *n*th root, exponential, logarithmic, and trigonometric equations, as assessed by tests, quizzes, homework, or projects.
* use matrices to solves systems of equations, as assessed by tests, quizzes, homework, or projects.
* perform operations with vectors, as assessed by tests, quizzes, homework, or projects.
* differentiate between essential and extraneous information, and implement his/her knowledge of the aforesaid skills to solve applied mathematics problems, as assessed by tests, quizzes, homework, or projects.

**General Education Student Learning Outcomes:**

Students will apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

**Course Outline:**

**Unit I Graphs and Functions**

Graphs of Equations

Lines

Functions

A Library of Functions

Transformations of Functions

Combining Functions; Composition of Functions

Inverse Functions

**Unit II Polynomial and Rational Functions**

Quadratic Functions

Polynomials Functions

Dividing Polynomials and the Rational Zeros Test

Zeros of a Polynomial Functions( **Review Complex Numbers** )

Rational Functions

Variation

**Unit III Exponents and Logarithms Functions**

Exponential Functions

Logarithms Functions

Properties of Logarithms

Exponential and Logarithmic Equations and Inequalities

**Unit IV Trigonometric Functions**

Angles and Their Measure

The Unit Circle

Trigonometric Functions of Angles

Right Triangle Trigonometry

Graphs of the Sine and Cosine Functions

Graphs of the other Trigonometry Functions

Inverse Trigonometric Functions

**Unit V Analytic Trigonometry**

Trigonometric Identities and Equations

Trigonometric Equations

Sum and Difference Formulas

Double-Angle and Half-Angle Formulas

Product-To-Sum and Sum-To-Product Formulas

**Unit VI Applications of Trigonometric Functions**

The Law of Sines

The Law of Cosines

Vectors

The Dot Product

Parametric Equations

Polar Coordinates

**VII Systems of Equations and Inequalities and Matrices**

Matrices and Systems of Equations

Determinants and Cramer's Rule

Partial-Fraction Decomposition

Matrix Algebra  
The Matrix Inverse

**VIII Sequences and Series,**

Sequences

Series

**Unit VIII Analytic Geometry**

Conic Sections: Overview  
The Parabola  
The Ellipse  
The Hyperbola

**Course Activities:**

The classroom activities will include formal and informal lectures where new material and assigned problems will be explained. Students will be encouraged to participate in discussion during the presentation and at times present problems on the blackboard. Time will be set aside to answer specific questions concerning homework problems and other previous material. The calculator will be an integral part of the class; a computer algebra system will be stressed whenever possible.

**Assessment of Student Learning Outcomes**: The student will be evaluated on the degree to which student learning outcomes are achieved.. In addition to a minimum of two tests, a variety of methods may be used such as class participation, projects, homework assignments, etc. (There must be some evidence that the learning outcomes have been achieved.) Student progress will be evaluated on the following basis:

1. Unit Tests

2. Periodic Quizzes, if you deem they are necessary to motivate students to study and attend

class on a regular basis.

3. Electronic Homework assignments, if graded.

4. Other graded homework or software projects.

5. Class attendance, if you have specified this at the beginning of the semester.

6. Comprehensive final examination (optional).

**Grading:**

Grades will be based on student's performance in the above designated areas. Percentages

will be assigned by each individual professor.

**A** 90 to 100

**B** 80 to 89

**C** 70 to 79

**D** 60 to 69

**F** Below 60

**I** Incomplete (only under extreme emergencies) Must be completed within one semester.

**NA** Not attending

**XA** Never Attended

**W** Withdraw (student must submit an official withdrawal form

by the deadline).

**Textbook:**

*Precalculus: A Unit Circle Approach,* Current Edition. Ratti-McWaters, Pearson.

**Supplemental Materials:** *Students Solutions Manual*

T1-83/84 Plus Graphing Calculator – recommended

Textbook specific course management system.