SUSSEX COUNTY COMMUNITY COLLEGE

**Master College Syllabus**

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| --- | --- | --- | --- | --- |
| MATH110 |  | PRECALCULUS I |  | I |
| COURSE # |  | COURSE TITLE |  | CLASSIFICATION |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 3 |  | 3 |  | 0 |
| CREDITS |  | CLASS HOURS |  | LAB HOURS |

**RECOMMENDED COURSE MATERIALS:**

Title: Precalculus

Author: Robert Blitzer

Publisher: Pearson

Edition: 7th

ISBN: 9780136922193

**OR**

Title: MYLAB with Pearson Etext for Precalculus – Access Card (18 Weeks)

Author: Blitzer & Blitzer

Publisher: Pearson

Edition: 7th

Copyright: 1/1/2022

ISBN: 9780137321681

**Required** Graphing Calculator: TI-83, TI-83 Plus, or TI-84

**CATALOG DESCRIPTION:**

This course is designed to strengthen algebraic skills and give students the math confidence to proceed with calculus and other higher forms of mathematics. Topics include the study of functions, graphing techniques, polynomial, rational exponential and logarithmic functions and systems of equations and inequalities.

**PREREQUISITE:** MATH040 (grade of CI) or appropriate pre-calculus placement score.

**TOPICS TO BE INCLUDED:**

##### A. Functions and Their Graphs

1. Graphs of Equations

2. Analyzing Graphs of Functions

3 A Library of Parent Functions

4. Transformations of Functions

5. Combinations of Functions: Composite Functions

6. Inverse Functions

7. Mathematical Modeling and Variation

##### B. Polynomial and Rational Functions

1. Quadratic Functions and Models

2. Polynomial Functions of Higher Degree

3. Polynomials and Synthetic Division

4. Complex Numbers

5. Zeros of Polynomial Functions

6. Rational Functions

##### C. Exponential and Logarithmic Functions

1. Exponential Functions and Their Graphs

2. Logarithmic Functions and Their Graphs

3. Properties of Logarithms

4. Exponential and Logarithmic Equations

5. Exponential and Logarithmic Models

##### D. Systems of Equations and Inequalities

1. Linear and Non-Linear Systems of Equations

2. Two-Variable Linear Systems

3. Multivariable Linear Systems

4. Partial Fractions

5. Systems of Inequalities

**COURSE COMPETENCIES**/**LEARNING OUTCOMES:**

In a manner deemed appropriate by the instructor and approved by the department, students will be able to:

1. Specify the graphical and algebraic characteristics of a polynomial, radical, piecewise, greatest integer, rational, exponential, and logarithmic function given its equation or its graph.
2. Identify transformations of parent functions, including exponential and logarithmic functions given their equations or graphs.
3. Write the equations of lines parallel and perpendicular to a given line.
4. Combine functions arithmetically and find the composition of one function with another.
5. Find inverse functions informally and algebraically.
6. Write mathematical models for direct, inverse, and joint variation.
7. Use the Remainder Theorem, the Factor Theorem, and Descartes Rule of Signs to determine real zeros of polynomial functions.
8. Sketch the graphs of polynomial functions without using a calculator.
9. Factor polynomial functions into linear factors and determine all zeros of the functions.
10. Find intercepts, asymptotes, and sketch a rational function without using a calculator.
11. Rewrite logarithmic expressions using the properties of logs.
12. Solve exponential and logarithmic equations.
13. Determine the equation of a parabola given three points.
14. Decompose a rational expression into the sum of two or more fractions.
15. Solve systems of non-linear equations and inequalities and determine equilibrium points.
16. Employ mathematical modeling techniques to solve problems using polynomial, rational, exponential and logarithmic functions

The ability of students to demonstrate the course competencies is assessed by a cumulative departmental final exam designed to test the knowledge and skills specified by the learning outcomes. All students are required to take the departmental final exam in a proctored setting. The final exam must count for at least 25% of each student’s final grade.

Summary statistics describing student performance on the departmental final exam are compiled twice a year. A comprehensive item analysis of the departmental final exam performance is conducted every two years. Assessment results are used to improve the teaching and learning of Precalculus I.

**GRADES COUNTED IN THE GRADE POINT AVERAGE (GPA)**

|  |  |  |
| --- | --- | --- |
| Letter Grade | Grade Points | Percent Range |
| A | 4.0 | 93-100% |
| A- | 3.67 | 90-92 |
| B+ | 3.5 | 88-89 |
| B | 3.0 | 83-87 |
| B- | 2.67 | 80-82 |
| C+ | 2.5 | 78-79 |
| C | 2.0 | 70-77 |
| D | 1.0 | 65-69 |
| F | 0.0 | 0-64 |
| FN | Fail no-show |  |

MATH110

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