**JEFFERSON COMMUNITY COLLEGE EDGE PROGRAM**

**AT BELLEVILLE HENDERSON CSD**

**MTH 185**

**PRECALCULUS**

Contact Hours: 4 Credit Hours: 4

**PREREQUISITE**:

Three years of high school mathematics, including Algebra 2 and a grade of at least 85% on the Algebra 2 Regents Exam, or completion of MTH 165 College Algebra and Trigonometry with a grade of C or better OR by math placement by CPT

**DESCRIPTION OF COURSE**:

This course is designed to prepare students for success in the study of calculus. Concepts and functions will be represented graphically, numerically, symbolically and verbally. Linear, quadratic, exponential, and logarithmic functions are reviewed. Critical thinking is developed as instruction focuses on the study of trigonometric, power, polynomial and rational functions and their operations. Students will be expected to demonstrate competence in the use of current technology as it applies to Precalculus topics.

This course satisfies a SUNY General Education learning outcome or outcomes. Some work that you do in this course (test, papers, projects) may be retained by Jefferson Community College in order to demonstrate to SUNY overall levels of student achievement for General Education.

**INSTRUCTIONAL GOALS**:

Upon completion of this course a student will be able to:

1. Represent relations and functions verbally, graphically, numerically, and symbolically;
2. Interpret the language of mathematics;
3. Simplify mathematical expressions;
4. Solve equations;
5. Determine a function of best fit using regression analysis;
6. Determine the reasonableness of solutions;
7. Recognize the limitations of mathematical models;
8. Utilize current technology.

**ATTENDANCE POLICY:**

Attendance at **EVERY** class is expected. You are responsible for everything that is discussed in class whether you are there or not. Attendance is covered by the Belleville Henderson CSD minimal attendance policy, which can be found in the student planner.

**COURSE METHODS**:

1. Video, Lecture and class discussion.

2. Small group activities and exercises.

3. Calculator (TI-Nspire) and computer usage (WileyPlus online textbook and homework).

**EVALUATION**:

Quizzes and Exams 55% of the Marking Period Grade

Homework/Classwork 20% of the Marking Period Grade

ONE Comprehensive Final Exam 25% of the Final Grade

**TOPIC OUTLINE**

1. Review of Linear, Quadratic, Exponential and Logarithmic Functions
2. Functions
   1. Notation-Input and Output
   2. Domain and Range
   3. Piece-wise Defined Functions
   4. Composite Functions
   5. Inverse Functions
   6. Concavity
3. Transformations of Functions and Their Graphs
   1. Shifts, Reflections and Symmetry
   2. Vertical Stretches and Compressions
   3. Combining Transformations
4. Trigonometry and Periodic Functions
   1. Introduction to Periodic Functions
   2. The Sine and Cosine Functions
   3. Radians and Arc Length
   4. Graphs of Sine and Cosine
   5. Sinusoidal Functions
   6. The Tangent Function
   7. Trigonometric Relationships and Identities
   8. Inverse Trigonometric Functions
5. Triangle Trigonometry
   1. Trig functions and Right Triangles
   2. Non-Right Triangles
   3. *Polar Coordinates (as time permits)*
6. Trigonometric Identities and Their Applications
   1. Trigonometric Equations and Inverse Functions
   2. Identities, Expressions, and Equations
   3. Sum and Difference Formulas for Sine and Cosine
   4. *Trigonometric Models (as time permits)*
   5. *Complex Numbers and Demoivre’s Theorem (as time permits)*
7. Compositions, Inverses, and Combinations of Functions
   1. Composition of Functions
   2. Invertibility and Properties of Inverse Functions
   3. Combinations of Functions
8. Polynomial and Rational Functions
   1. Power Functions
   2. Polynomial Functions
   3. The Short-Run Behavior of Polynomials
   4. Rational Functions
   5. The Short-Run Behavior of Rational Functions
   6. Comparing Power, Exponential, and Log Functions
   7. Fitting Exponentials and Polynomials to Data
9. Vectors and Matrices (as time permits)
   1. Vectors
   2. The components of a vector
   3. Application of Vectors
   4. The Dot Product
   5. Matrices
10. Parametric Equations and Conic Sections (as time permits)
    1. Parametric Equations
    2. Implicitly Defined Curves and Circles

**COURSE MATERIALS**:

**Textbook**: FUNCTIONS MODELING CHANGE, 5th Edition

A Preparation for Calculus

By Eric Connally

**Software**: WileyPlus

**Calculator**: TI-Nspire CX Graphing Calculator

**INSTRUCTOR INFORMATION:**

Instructor Name:Mr. David Green

Email: [dgreen@bhpanthers.org](mailto:dgreen@bhpanthers.org)

On-Campus Phone:846-5121