

# SUNY Cobleskill College in the High School

## MATH 131 Pre-Calculus Mathematics

**Term:** Fall 2019

**Instructor Name:** Christine Seals

**Credit Hours:** 4

**Office Address:** Jefferson Central Rm 213

**Class Meeting Time:** Period 8 (1:36 – 2:17)

**Location:** Jefferson Central School

**Class Fee:** \$200

**Phone:** 607 – 652 – 7821

**Email Address:** [cseals@Jeffersoncsd.org](mailto:cseals@Jeffersoncsd.org)

**Course Description:** This is an applications oriented course in which students are exposed to a variety of techniques (e.g., numerical, geometric, and algebraic) for solving problems. The use of technology, specifically the TI-84 graphing calculator is an important part of the course. Topics studied are Trigonometry, Conic Sections, Vectors, Matrices, Polynomial Function, Exponential Functions and Rational Functions

**Pre-Requisites:** High School Algebra II

Student Learning Outcomes:

1. Represent and manipulate polynomial, rational, and trigonometric functions and relations algebraically, graphically, and numerically, including partial fraction decomposition and finding zeros of functions
2. Engage in algebraic, graphic, and trigonometric problem solving and modeling
3. Synthesize algebraic and trigonometric facts and laws
4. Investigate vectors and matrices and their uses
5. Derive and analyze conic sections

**Course Objectives:** This course is intended primarily to prepare students for a course in Calculus. It can also be used for general Mathematics credit. This course will provide students with a working knowledge of elementary functions and their graphs, including polynomial, rational, and trigonometric functions, and to become proficient in the algebra of functions.

**Measurement Criteria:** This course will have typical lectures, class work, and graded exams ( 3 worth 100 points and a Final Exam worth 200 points). Homework will not be collected or graded but will be assigned nearly every day. The exams will be based upon homework problems.

**Grading Criteria:** There will be 3 exams worth 100 points each, one given approximately every 5 weeks. Make up exams will be given in the case of an EXCUSED absence, immediately following the student's return to class. A final exam will be given at the end of the semester, valued at 200 points. Letter grades will be assigned the following numerical grade intervals:

Percent Range:

Letter Grade:

92.1 or higher

A

|                |    |
|----------------|----|
| 89.5 – 92.0    | A- |
| 86.9 – 89.4    | B+ |
| 82.1 – 86.8    | B  |
| 79.5 – 82.0    | B- |
| 76.9 – 79.4    | C+ |
| 72.1 – 76.8    | C  |
| 69.5 – 72.0    | C- |
| 66.9 – 69.4    | D+ |
| 62.1 – 66.8    | D  |
| 59.5 – 62.0    | D- |
| Less than 59.5 | F  |

**Class Schedule of Topics or Outline:**

| Time/Month                                         | Content                                                       | Skills                                                                                                                                                                                                                                  |
|----------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| September (Week 1) - September (Week 4)<br>16 Days | Chapter 1 Trigonometry                                        | Circular Functions, Exact Trig Values, Trig Identities, Trig Formulas, Trig Equations, Right Triangle Trig, Law of sines and cosines                                                                                                    |
| October (week 1) - October (Week 2)<br>7 Days      | Chapter 2 Conic Sections                                      | Parabolas, Ellipses, Hyperbolas, and Circles                                                                                                                                                                                            |
| October (Week 3) - October (Week 4)<br>9 Days      | Chapter 3 Vectors                                             | Operations, Ordered Pairs/Linear Combinations, 3-space, Dot Product, Cross Product, Parametric Equations                                                                                                                                |
| October (week 5) - November (Week 1)<br>11 Days    | Chapter 4 Matrices                                            | Determinants, Operations, Systems of Equations, Inverse Matrices, Applications                                                                                                                                                          |
| November (Week 2) - November (Week 4)<br>12 Days   | Chapter 5 Polynomial and Rational Functions                   | Even/odd, Quadratic Function, Degree >2, Remainder Theorem, Factor Theorem, Long/Synthetic Division, Rational Root Theorem, Descartes' Rule of Signs, Roots of a polynomial, Approximate Real Roots                                     |
| December (Week 1) - December (Week 2)<br>8 Days    | Chapter 6 Exponential and Logarithmic Functions               | Exponential Functions, Logarithmic Functions, Properties of Logarithms, Solving Exponential and Logarithmic Equations, Exponential and Logarithmic Models                                                                               |
| December (Week 3) January (week 3)<br>15 days      | Chapter 7 Functions and their Graphs and Miscellaneous Topics | Difference Quotient, Common Functions & Properties, Functions - Transformations & Inverse, Continuous vs. Discontinuous Functions, Special Characteristics of Functions, Rational Functions, Binomial Expansion, Mathematical Induction |

|                |       |                       |
|----------------|-------|-----------------------|
| January Week 4 | Final | Review and Final Exam |
|----------------|-------|-----------------------|

**Required Materials:**

Text: Larson, Hostetler, Edwards, *Precalculus: Functions and Graphs, A Graphing Approach* (5th Ed): Houghton Mifflin Company, 2008

Materials: TI – 84 Calculator, 2 or 3 inch binder, loose leaf paper, Pencils/Pens

**Attendance Policy:** A student should not miss more than 5 classes over the course of the semester. EXCUSED absences (doctor appt, dentist appt, mandatory field trips, etc.) will not count against the student as long as documentation is provided. If a student accumulates more than 5 unexcused absences, the student's final grade will be greatly affected.