**Course Syllabus**

**Marshall University – Tygarts Valley High School**

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| **Course Title/Number** | Math 127 College Algebra / Pre-Calculus |
| **Semester/Year** | Fall 2017 |
| **Days/Time** | Monday through Friday 7:41am – 9:11 am |
| **Location** | Tygarts Valley High School Mill Creek, WV |
| **Instructor** | Beth Arbogast |
| **Office** | Room 305 |
| **Phone** | 304-335-4575 |
| **E-Mail** | barbogast@k12.wv.us |
| **Office Hours** | 11:27 – 12:57 |
| **University Policies** | By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to [www.marshall.edu/academic-affairs/policies/](http://www.marshall.edu/academic-affairs/policies/). Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment |

**Course Description: From Catalog**

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| Math 127 Marshall University Course Description: A brief but careful review of the main techniques of algebra. Polynomial, rational, exponential, and logarithmic functions. Graphs, equations and inequalities, sequences.  Pre-Calculus Course Description: The course objectives extend student’ knowledge of functions, and equations, including higher – order functions, exponential and logarithmic functions, as well as provide preparation for calculus. |

**Content Standards (from the WV Content Standards and Objectives)**

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| **Course student learning outcomes** | **How students will practice each outcome in this course** | **How student achievement of each outcome will be assessed in this course** |
| Students will | Students will investigate and sketch the graphs of polynomial and rational functions by analyzing and using the characteristics of zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes and end behavior, max and min points, and domain and range. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Solve higher order polynomial equations utilizing techniques such as Descartes’ Rule of Signs, Upper and lower bounds, and the Rational Root Theorem. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Relate Pascal’s Triangle and the Binomial Theorem; use both to expand binomials with positive integer exponents. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Establish and explain the inverse relationship between exponential and logarithmic functions; graph related functions and include their domain and range using interval notation. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Compare laws of exponents to properties of logarithms; solve equations and practical problems involving exponential and logarithmic expressions, including natural and common logs; confirm solutions graphically and numerically. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Solve problems involving the sum of finite and infinite sequences and series, including sigma notation. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Use tables of values, graphs, conjectures, algebraic methods, and numerical substitution to find or estimate the limit of a function, sequence or a series. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Analyze and describe the geometry of vectors, perform mathematical operations with vectors, and use vectors to solve practical problems. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Apply parametric methods to represent motion of objects. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Use multiple representations, such as words, graphs, tables, and equations, to solve practical problems involving logarithmic, exponential, polynomial, rational, and radical functions; explain how the representations are related to each other, as well as to the problem. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Graph functions and conic sections using transformations. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Analyze and describe properties of conic sections; explain the interrelationship among the properties; solve practical problems involving conic sections. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |
| Students will | Identify and analyze a practical application of exponential or logistic growth or decay. | Teacher created assessments.  Appropriate and applicable problems from the text as assigned. |

**Required Texts, Additional Reading, and Other Materials**

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| Pre – Calculus Enhanced with Graphing Utilities, 5e, Sullivan and Sullivan |

**Course Requirements/Due Dates**

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| Students must have successfully completed Algebra 1, Geometry, Algebra 2 with a B average or higher. To register for Dual Credit Math 12, high school students in the 11th or 12th grade must meet Marshall University’s admission requirements of a cumulative GPA of 3.0 on a 4.0 scale and an ACT Math score of 19 or higher or a SAT Math score of 460 or higher. |

**Grading Policy**

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| A 90 – 100%  B 80 – 89%  C 70 – 79%  D 60 – 69%  F below 60%  Grades can be accessed by students and parents at www.livegrades.com |

**Attendance Policy**

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| This course meets for 90 minutes per day, 5 days per week for 18 weeks. Good attendance is absolutely necessary for success in this course. Students will be provided with an outline of course assignments prior to beginning each unit. When school is missed due to an absence, weather related condition, or school holidays, students should continue to adhere to the provided outline. Livegrades message center will be utilized to communicate any changes or updates to the provided outline. |

**Pre – Calculus / Math 127 Course Schedule**

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| **WEEK** | **TOPIC** |
| 1 | Sequences, Arithmetic and Geometric Sequences, Geometric Series |
| 2 | Mathematical Induction, Binomial Theorem, Pascal’s Triangle |
| 3 | Interval Notation, Sets, Counting Principle, Permutations, Combinations, Probability |
| 4 | Functions, Graph of Functions, Properties of Functions |
| 5 | Library of Functions, Piece-wise Functions, Graphing with Transformations, Applications – Building Functions |
| 6 – 7 | Polynomial Functions, Real zeros of a Polynomial Function, Complex zeros of a Polynomial Function, Graphing Polynomial Function |
| 8 | Rational Functions, Properties and Asymptotes of Rational Functions, Graphing Rational Functions |
| 9 | Composite Functions, One-to-One Functions, Inverse Functions |
| 10 – 11 | Exponential Functions, Logarithmic Functions, Properties of Logarithms, Solving Exponential and Logarithmic Equations, Applications of Exponential and Logarithmic Functions |
| 12 | Polar Coordinates, Polar Equations and Graphs, Complex Plane, DeMoivre’s Theorem |
| 13 | Vectors, Dot Product, Vectors in Space, Cross Product |
| 14 – 15 | Conic Sections, Circle, Parabola, Ellipse, Hyperbola, General Form of a Conic |
| 16 | Plane Curves and Parametric Equations |
| 17 | Finding Limits using Tables, Graphs, and Algebra |
| 18 | Review, Final Exam |