Course Name: Functions, Statistics, & Trigonometry (FST)

Course Code: H2302 Grades: 11-12 Level: Academic Year: 5X Credits: 5

Course Description: This course integrates functions, statistics and trigonometry and applies the algebra and geometry students have studied in their previous years. There is an extensive application of representative data throughout this course. Mathematical topics include: Graphing Data Representation and Functional Data Modeling, Trigonometric Functions, Polynomial Functions, Probability and Sampling, Sequences and Series, Exponential and Logarithmic Equations.

Prerequisite: Algebra II

Course Proficiencies: The following is a list of the proficiencies that describe what students are expected to know and be able to do as a result of successfully completing this course. The proficiencies are the basis of the assessment of student achievement. The learner will demonstrate the ability to:

- 1. Use methods of census, sample survey, experiment, and observational study as methods of data collection. *S-IC.3*
- 2. Interpret graphical displays of distributions of univariate data using boxplot, dotplot, stemplot, histogram, or cumulative frequency plot. *S-ID.1*
- 3. Describe distributions of a graph, its shape, center, spread, gaps and clusters, outliers, and any unusual features. *S-ID.3*
- 4. Use mean, median, and mode to measure the center of data. *S-ID.2*
- 5. Use range, interquartile range, and standard deviation to describe the spread of the data. *S-ID.4*
- 6. Use a scatterplot to graphically display the possible relationship between two quantitative variables. *S-ID.6*
- 7. Use the correlation coefficient to measure strength and direction of the linear relationship between two quantitative variables in a scatterplot. *S-ID.8, S-ID.9*
- 8. Fit a model to data. (linear, quadratic, and exponential functions) *A-CED.2, A-REI.10, F-BF.1c*
- 9. Solve, graph, and analyze quadratic equations by finding square roots, factoring, or using the Quadratic Formula and apply them in real-life problems. *N-CN.7, A-SSE.3a &b, A-REI.4, F-IF-7a, F-IF.8a, A-APR.3*
- 10. Perform operations with functions; Use composite functions to explore inverse functions and their properties (domain and range). *F-BF.1b & c, F-IF.2-5, F-BF.4a & c*
- 11. Use properties of radicals and/or rational exponents to solve equations and apply to real-life problems. *N-RN.1, N-RN.2, A-SSE.3c, F-IF.8b*
- 12. Perform operations with rational expressions and solve rational equations. *A-APR.7*, *A-REI.2*
- 13. Add, subtract, and multiply polynomials. A-APR.1

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FST Proficiencies – cont'd.

- 14. Measure angles in standard position using degree and radian measure. Derive the unit circle and apply the definitions of reference angles and conterminal angles towards solving real-life problems. *F-FT.1, F-FT.2*
- 15. Find arc lengths and sector areas of circles. G-C.5
- 16. Use inverse trigonometric functions to solve right triangles. *G-SRT.8*
- 17. Solve and classify oblique triangles using the Law of Sines and Law of Cosines. *G-SRT.10, G-SRT.11*
- 18. Graph and analyze periodic functions and their inverses. F-FT.4, F-FT.5, F-FT.6
- Graph exponential and logarithmic functions and use their properties to solve real-life problems (compound interest, growth and decay). *F-LE.1, F-LE.3, F-LE.4, F-LE.5, A-SSE.1b, F-BF.5*
- 20. Add, subtract, multiply and divide polynomials. A-APR.1
- Solve, graph, and analyze polynomial functions using polynomial long division, synthetic division, factoring, the Rational Root Theorem, the Remainder Theorem, and the Fundamental Theorem of Algebra. *N-CN.7, A-SSE.3a &b, A-REI.4, F-IF-7a, F-IF.8a, A-APR.3, A-APR.2*
- 22. Discuss and analyze arithmetic and geometric series. F-IF.3, F-BF.1a, F-BF.2, F-LE.2
- 23. Find the probability of independent and dependent events. S-CP.3, S-CP.5
- 24. Limits & Sequences.
- 25. Apply mathematics in practical situations and in other disciplines.
- 26. Use critical thinking skills to make sense of problems, solve them, and communicate processes. *CRP 2, 4 & 8.*
- 27. Use technology to gather, analyze, and communicate mathematical information. *8.1.12.A.3, 8.1.12.C.1*

Assessment: Evaluation of student achievement in this course will be based on the following:

- A. Tests
- B. Projects
- C. Classwork
- D. Maintaining a folder/notebook
- A. Tests are usually given at the end of a unit. These generally require a full period to complete.
- B. During the course, special projects such as research papers, outlines, surveys, and computer-based projects may be assigned to students. These activities are major in scope. The grades on projects will count as major grades when determining the course grade.
- C. Classwork, evidenced by completed and carefully presented daily work and by the meeting of daily responsibilities, is an essential part of learning. The day-to-day work included as classwork may involve quizzes, the written results of learning activities, graded homework, and assessments of learning observed during class. The more a student is involved, the more learning that takes place.
- D. Folders/Notebooks must be maintained by students. These typically include notes and assignments kept in an organized fashion.

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Board Adopted Materials:

Textbook Title: **Core-Plus Mathematics, Course 4** Author: Hirsch, Fey, Schoen, & Watkins Publisher: McGraw-Hill Education Copyright: 2015