GSE Pre-Calculus Curriculum Map

1st Semester				2nd Semester			
Unit 1	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**	**Unit 6**	**Unit 7**	**Unit 8**
Introduction to Trigonometric Functions *(4 – 5 weeks)*	**Trigonometric Functions** *(4 – 5 weeks)*	**Trigonometry of General Triangles** *(3 – 4 weeks)*	**Trigonometric Identities** *(3 – 4 weeks)*	**Matrices** *(3 – 4 weeks)*	**Conics** *(3 – 4 weeks)*	**Vectors** *(4 – 5 weeks)*	**Probability** *(4 – 5 weeks)*
MGSE9-12.F.IF.4 MGSE9-12.F.IF.7 MGSE9-12.F.IF.7e MGSE9-12.F.TF.1 MGSE9-12.F.TF.2 MGSE9-12.F.TF.5 MGSE9-12.F.TF.8	MGSE9-12.F.BF.4 MGSE9-12.F.BF.4d MGSE9-12.F.TF.3 MGSE9-12.F.TF.4 MGSE9-12.F.TF.6 MGSE9-12.F.TF.7	MGSE.9-12.G.SRT.9 MGSE.9-12.G.SRT.10 MGSE.9-12.G.SRT.11	MGSE9-12.F.TF.9	MGSE9-12.N.VM.6 MGSE9-12.N.VM.7 MGSE9-12.N.VM.8 MGSE9-12.N.VM.9 MGSE9-12.N.VM.10 MGSE9-12.N.VM.12 MGSE9-12.A.REI.8 MGSE9-12.A.REI.9	MGSE9-12.G.GPE.2 MGSE9-12.G.GPE.3 MGSE9-12.A.REI.7	MGSE9-12.N.CN.3 MGSE9-12.N.CN.4 MGSE9-12.N.CN.5 MGSE9-12.N.CN.6 MGSE9-12.N.VM.1 MGSE9-12.N.VM.2 MGSE9-12.N.VM.3 MGSE9-12.N.VM4 MGSE9-12.N.VM4a MGSE9-12.N.VM4b MGSE9-12.N.VM4c MGSE9-12.N.VM.5 MGSE9-12.N.VM.5a MGSE9-12.N.VM.5b MGSE9-12.N.VM.11	MGSE9-12.S.CP.8 MGSE9-12.S.CP.9 MGSE9-12.S.MD.1 MGSE9-12.S.MD.2 MGSE9-12.S.MD.3 MGSE9-12.S.MD.4 MGSE9-12.S.MD.5 MGSE9-12.S.MD.5a MGSE9-12.S.MD.5b MGSE9-12.S.MD.6 MGSE9-12.S.MD.7

These units were written to build upon concepts from prior units, so later units contain tasks that depend upon the concepts addressed in earlier units.
All units will include the Mathematical Practices and indicate skills to maintain.

NOTE: Mathematical standards are interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics.

Grade 9-12 Key:

Number and Quantity Strand: RN = The Real Number System, Q = Quantities, CN = Complex Number System, VM = Vector and Matrix Quantities

Algebra Strand: SSE = Seeing Structure in Expressions, APR = Arithmetic with Polynomial and Rational Expressions, CED = Creating Equations, REI = Reasoning with Equations and Inequalities

Functions Strand: IF = Interpreting Functions, LE = Linear and Exponential Models, BF = Building Functions, TF = Trigonometric Functions

Geometry Strand: CO = Congruence, SRT = Similarity, Right Triangles, and Trigonometry, C = Circles, GPE = Expressing Geometric Properties with Equations, GMD = Geometric Measurement and Dimension, MG = Modeling with Geometry

Statistics and Probability Strand: ID = Interpreting Categorical and Quantitative Data, IC = Making Inferences and Justifying Conclusions, CP = Conditional Probability and the Rules of Probability, MD = Using Probability to Make Decisions

GSE Pre-Calculus Expanded Curriculum Map – 1st Semester

Unit 1	Unit 2	Unit 3	Unit 4
Introduction to Trigonometric Functions	**Trigonometric Functions**	**Trigonometry of General Triangles**	**Trigonometric Identities**
MGSE9-12.F.IF.7e Graph trigonometric functions, showing period, midline, and amplitude. **MGSE9-12.F.TF.2** Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	**MGSE9-12.F.BF.4d** Produce an invertible function from a non-invertible function by restricting the domain. **MGSE9-12.F.TF.7** Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.	**MGSE9-12.G.SRT.9** Derive the formula $A = (1/2)ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. **MGSE9-12.G.SRT.11** Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	**MGSE9-12.F.TF.9** Prove addition, subtraction, double and half-angle formulas for sine, cosine, and tangent and use them to solve problems.

Unit 5	Unit 6	Unit 7	Unit 8
Matrices	**Conics**	**Vectors**	**Probability**
MGSE9-12.N.VM.8 Add, subtract, and multiply matrices of appropriate dimensions. **MGSE9-12.A.REI.9** Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	**MGSE9-12.G.GPE.2** Derive the equation of a parabola given a focus and directrix. **MGSE9-12.G.GPE.3** Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.	**MGSE9-12.N.CN.4** Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number. **MGSE9-12.N.CN.5** Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. **MGSE9-12.N.VM.1** Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes **MGSE9-12.N.VM.3** Solve problems involving velocity and other quantities that can be represented by vectors.	**MGSE9-12.S.CP.9** Use permutations and combinations to compute probabilities of compound events and solve problems. **MGSE9-12.S.MD.2** Calculate the expected value of a random variable; interpret it as the mean of the probability distribution. **MGSE9-12.S.MD.5** Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding values.