# Textbook Alignment to the Utah Core – Pre-Calculus

***This alignment has been completed using an "Independent Alignment Vendor" from the USOE approved list (www.schools.utah.gov/curr/imc/indvendor.html.) Yes _____ No _____***

**Name of Company and Individual Conducting Alignment: _____**

**A "Credential Sheet" has been completed on the above company/evaluator and is (Please check one of the following):**

☐ **On record with the USOE.**

☐ **The "Credential Sheet" is attached to this alignment.**

**Instructional Materials Evaluation Criteria (name and grade of the core document used to align): Pre-Calculus Core Curriculum**

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**Title: _____ ISBN#: _____**

**Publisher: _____**

**Overall percentage of coverage in the *Student Edition (SE) and Teacher Edition (TE)* of the Utah State Core Curriculum: _____%**

**Overall percentage of coverage in *ancillary materials* of the Utah Core Curriculum: _____%**

**STANDARD I: Students will acquire number sense and perform fundamental operations with complex numbers and vectors.**

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| **Percentage of coverage in the *student and teacher edition* for Standard I:_____ %** | **Percentage of coverage not in student or teacher edition, but covered in the *ancillary material* for Standard I: _____%** |

| **OBJECTIVES & INDICATORS** | **Coverage in *Student Edition(SE) and Teacher Edition (TE)* (pg #'s, etc.)** | **Coverage in *Ancillary Material* (titles, pg #'s, etc.)** | ***Not covered in TE, SE or ancillaries*** ✓ |
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| **Objective 1.1:** Represent complex numbers and vectors in a variety of ways. | | | | |
| **a.** | Represent vectors graphically and symbolically. | | | |
| **b.** | Represent complex numbers in rectangular and polar form and convert between rectangular and polar form. | | | |
| **Objective 1.2:** Compute fluently with vectors and complex numbers. | | | | |
| **a.** | Add and subtract vectors using a variety of techniques. | | | |
| **b.** | Perform scalar multiplication on vectors using a variety of techniques. | | | |
| **c.** | Multiply complex numbers in polar form and use DeMoivre's Theorem to find roots of complex numbers. | | | |
| **STANDARD II: Students will use the language of algebra to analyze and represent relationships, including real-life applications.** | | | | |
| **Percentage of coverage in the *student and teacher edition* for Standard II:_____ %** | | **Percentage of coverage not in student or teacher edition, but covered in the *ancillary material* for Standard II: _____%** | | |
| **OBJECTIVES & INDICATORS** | | **Coverage in *Student Edition(SE) and Teacher Edition (TE)* (pg #'s, etc.)** | **Coverage in *Ancillary Material* (titles, pg #'s, etc.)** | ***Not covered in TE, SE or ancillaries*** ✓ |
| **Objective 2.1:** Analyze power, polynomial, rational, exponential, logarithmic, piece-wise, and trigonometric functions. | | | | |
| **a.** | Identify the domain, range, and other attributes of families of functions and their inverses. | | | |
| **b.** | Relate logarithmic and exponential functions. | | | |
| **c.** | Simplify expressions using a variety of approaches and techniques. | | | |
| **d.** | Raise a binomial to a power using the Binomial Theorem. | | | |
| **Objective 2.2:** Solve problems and describe mathematical relationships using functions. | | | | |
| **a.** | Solve equations and inequalities involving exponential, | | | |

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| | logarithmic, power, polynomial, rational, and trigonometric functions that reflect real-world situations. | | | |
| **b.** | Combine and compose functions using numeric, algebraic, and graphical methods or by using technology when appropriate. | | | |
| **c.** | Identify the domain and range of a function resulting from the combination or composition of functions. | | | |
| **d.** | Model real world relationships with functions. | | | |
| **Objective 2.3:** Analyze the behavior of functions. | | | | |
| **a.** | Approximate instantaneous rates of change and find average rates of change using graphs and numerical data. | | | |
| **b.** | Determine intervals over which a function is increasing or decreasing. | | | |
| **c.** | Identify and analyze graphical features of functions such as x- and y- intercepts, zeros (roots), asymptotes, holes, extrema (local and global), and the end behavior. | | | |
| **d.** | Relate the graphical representation of discontinuities and end-behavior to the concept of limit. | | | |
| **e.** | Identify the effects of changing the parameters in transformations of functions. | | | |
| **Objective 2.4:** Analyze the behavior of sequences and series. | | | | |
| **a.** | Describe a sequence as a function with the domain of natural numbers. | | | |
| **b.** | Represent sequences and series using various notations. | | | |
| **c.** | Identify and accurately express arithmetic and geometric sequences and series. | | | |
| **d.** | Discover and justify the formula for a finite arithmetic series. | | | |
| **e.** | Discover and justify the formulas for finite and infinite geometric series. | | | |
| **STANDARD III: Students will solve problems using spatial and logical reasoning, applications of geometric principles, and modeling.** | | | | |
| **Percentage of coverage in the *student and teacher edition* for** | | **Percentage of coverage not in student or teacher edition, but covered in** | | |

| **Standard III:_____ %** | | **the *ancillary material* for Standard III: _____%** | | |
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| **OBJECTIVES & INDICATORS** | | **Coverage in *Student Edition(SE) and Teacher Edition (TE)* (pg #'s, etc.)** | **Coverage in *Ancillary Material* (titles, pg #'s, etc.)** | ***Not covered in TE, SE or ancillaries*** ✓ |
| **Objective 3.1:** Solve problems involving the geometric properties of conic sections and vectors. | | | | |
| **a.** | Write equations of conic sections in standard form to find their geometric properties. | | | |
| **b.** | Solve problems using the geometric properties of vectors. | | | |
| **c.** | Solve real life applications of conic sections and vectors. | | | |
| **Objective 3.2:** Solve problems using trigonometry. | | | | |
| **a.** | Define the six trigonometric functions using the unit circle. | | | |
| **b.** | Prove trigonometric identities using definitions, the Pythagorean Theorem, or other relationships. | | | |
| **c.** | Simplify trigonometric expressions and solve trigonometric equations using identities. | | | |
| **d.** | Solve problems using the Law of Sines and the Law of Cosines. | | | |
| **Objective 3.3:** Graph curves using polar and parametric equations. | | | | |
| **a.** | Define and use polar coordinates and relate them to Cartesian coordinates. | | | |
| **b.** | Translate equations in Cartesian coordinates into polar coordinates and graph them in the polar coordinate plane. | | | |
| **c.** | Define a curve parametrically and draw parametric graphs. | | | |
| **STANDARD IV: Students will draw reasonable conclusions using concepts, relationships, and algorithms of probability.** | | | | |
| **Percentage of coverage in the *student and teacher edition* for Standard IV:_____ %** | | **Percentage of coverage not in student or teacher edition, but covered in the *ancillary material* for Standard IV: _____%** | | |
| | | **Coverage in *Student Edition(SE) and Teacher Edition (TE)* (pg #'s, etc.)** | **Coverage in *Ancillary Material* (titles, pg #'s, etc.)** | ***Not covered in TE, SE or*** |

| OBJECTIVES & INDICATORS | | | | *ancillaries* ✓ |
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| **Objective 4.1:** Analyze bivariate data using linear regression methods. | | | | |
| **a.** | Fit the regression line to data on two numeric variables using the means and standard deviations of the two variables, and the correlation coefficient. | | | |
| **b.** | Fit regression lines to pairs of numeric variables using technology. | | | |
| **c.** | Distinguish between the two regression lines for each pair of variables, and know when it is appropriate to use each line. | | | |
| **d.** | Compute predictions of y-values for given x-values using a regression equation, and recognize the limitations of such predictions. | | | |
| **e.** | Compute and use the standard error for regression. | | | |
| **Objective 4.2:** Compute probabilities for discrete distributions and use sampling distributions to calculate approximate probabilities. | | | | |
| **a.** | Obtain sample spaces and probability distributions for simple discrete random variables. | | | |
| **b.** | Compute binomial probabilities using Pascal's Triangle and the Binomial Theorem. | | | |
| **c.** | Compute means and variances of discrete random variables. | | | |
| **d.** | Compute probabilities using areas under the Normal Curve. | | | |
| **e.** | Calculate parameters of sampling distributions for the sample average, sum, and proportion. | | | |
| **f.** | Calculate probabilities in real problems using sampling distributions. | | | |