Linear Algebra Standards

☐ ☐ **LE1. Systems as matrices.** I can translate back and forth between a system of linear equations, a vector equation, and the corresponding augmented matrix.

☐ ☐ **LE2. Row reduction.** I can explain why a matrix isn't in reduced row echelon form, and put a matrix in reduced row echelon form.

☐ ☐ **LE3. Counting solutions of of linear systems.** I can determine the number of solutions for a system of linear equations or a vector equation.

☐ ☐ **LE4. Solution sets of linear systems.** I can compute the solution set for a system of linear equations or a vector equation with infinitely many solutions.

☐ ☐ **VS1. Vector spaces.** I can explain why a given set with defined addition and scalar multiplication does satisfy a given vector space property, but nonetheless isn't a vector space.

☐ ☐ **VS2. Linear combinations.** I can determine if a Euclidean vector can be written as a linear combination of a given set of Euclidean vectors by solving an appropriate vector equation.

☐ ☐ **VS3. Spanning sets.** I can determine if a set of Euclidean vectors spans $\mathbb{R}^n$ by solving appropriate vector equations.

☐ ☐ **VS4. Subspaces.** I can determine if a subset of $\mathbb{R}^n$ is a subspace or not.

☐ ☐ **VS5. Linear independence.** I can determine if a set of Euclidean vectors is linearly dependent or independent by solving an appropriate vector equation.

☐ ☐ **VS6. Basis verification.** I can explain why a set of Euclidean vectors is or is not a basis of $\mathbb{R}^n$.

☐ ☐ **VS7. Basis computation.** I can compute a basis for the subspace spanned by a given set of Euclidean vectors, and determine the dimension of the subspace.

☐ ☐ **VS8. Polynomial and Matrix computation.** I can answer questions about vector spaces of polynomials or matrices.

☐ ☐ **VS9. Basis of solution space.** I can find a basis for the solution set of a homogeneous system of equations.

☐ ☐ **AT1. Linear map verification.** I can determine if a map between vector spaces of polynomials is linear or not.

☐ ☐ **AT2. Linear maps and matrices.** I can translate back and forth between a linear transformation of Euclidean spaces and its standard matrix, and perform related computations.

☐ ☐ **AT3. Kernel and Image.** I can compute a basis for the kernel and a basis for the image of a linear map, and verify that the rank-nullity theorem holds for a given linear map.

☐ ☐ **AT4. Injectivity and surjectivity.** I can determine if a given linear map is injective and/or surjective.

☐ ☐ **MX1. Matrix Multiplication.** I can multiply matrices.

☐ ☐ **MX2. Row operations as matrix multiplication.** I can can express row operations through matrix multiplication.

☐ ☐ **MX3. Invertible Matrices.** I can determine if a square matrix is invertible or not, and if so, compute its inverse.

☐ ☐ **GT1. Row operations and Determinants.** I can describe how a row operation affects the determinant of a matrix.

☐ ☐ **GT2. Determinants.** I can compute the determinant of a 4×4 matrix.

☐ ☐ **GT3. Eigenvalues.** I can find the eigenvalues of a 2×2 matrix.

☐ ☐ **GT4. Eigenvectors.** I can find a basis for the eigenspace of a 4×4 matrix associated with a given eigenvalue.