Data Science, Analytics and Engineering Ph.D.
Deficiency Courses

Deficiency coursework completed with a grade of "C" or better at the undergraduate level satisfies the requirements. A grade of "B" or better is required for all assigned deficiency coursework at the post-baccalaureate level.

CSE 205 OBJECT-ORIENTED PROGRAMMING AND DATA STRUCTURES

Problem solving by programming with an object-oriented programming language. Introduces data structures. Overview of computer science topics.
Prerequisite(s): CSE 100 or 110

MAT 242 ELEMENTARY LINEAR ALGEBRA OR MAT 342 LINEAR ALGEBRA OR MAT 343 APPLIED LINEAR ALGEBRA

- MAT 242: Introduces matrices, systems of linear equations, determinants, vector spaces, linear transformations, and eigenvalues. Emphasizes development of computational skills. **Prerequisite(s)**: MAT 210, MAT 251, MAT 265 or MAT 270
- MAT 342: Linear equations, matrices, determinants, vector spaces, bases, linear transformations and similarity, inner product spaces, eigenvectors, orthonormal bases, diagonalization, and principal axes. **Prerequisite(s):** MAT 267 or 272
- MAT 343: Solving linear systems, matrices, determinants, vector spaces, bases, linear transformations, eigenvectors, norms, inner products, decompositions, applications. Problem solving using MATLAB. **Prerequisite(s)**: MAT 266 or 271

MAT 267 CALCULUS FOR ENGINEERING III

Vector-valued functions of several variables, partial derivatives, multiple integration.
Prerequisite(s): MAT 266 or 271

IEE 380 PROBABILITY AND STATISTICS FOR ENGINEERING PROBLEM SOLVING

Applications-oriented course with computer-based experience using statistical software for formulating and solving engineering problems.
Prerequisite(s): MAT 266 or 271