ANALYTICS (ANA)

ANA 615 Optimization Methods for Data Analytics
This course introduces students to mathematical models that can be employed to make informed decisions in a wide variety of data-driven fields, including (but not limited to) finance, banking, marketing, health care, retail, manufacturing, and transportation. Goals such as increasing revenue, decreasing costs, and improving overall efficiency of operations in the face of various constraints are considered. Students learn to recognize when a problem lends itself to a particular type of model, formulate the model, and use appropriate methods to solve or extract information from the model. Particular emphasis is placed on linear programming (with exposure to network models and integer programs) and the simplex method. Forecasting, inventory management, and queueing models, as well as Markov chains, are also studied. Additional topics covered include sensitivity analysis, duality, decision analysis, and dynamic programming. Software (both spreadsheets and a computer algebra system) is employed consistently throughout the course to expedite the solution and analysis process; emphasis will be placed on the practical application of models rather than on the models' mathematical properties. Prerequisite(s): ANA 613