

Syllabus

OR 531 Analytics & Decision Analysis

Description

Course focus is predominantly on prescriptive analytics with some parts focused on predictive analytics. Topics include operations research techniques and their application to decision making such as mathematical optimization, networks modeling, stochastic modeling, and multi-objective modeling. Other topics such as PERT, CPM, computer simulation, decision analysis using decision trees and quantitative value functions, and heuristic methods are covered, as well as use of contemporary computer software for problem solving. In particular, the course will extensively use MS Excel for solving the decision making problems. Case-study approach to problem solving is used.

Pre-req: Graduate Standing

Text: The Art of Modeling with Spreadsheet – by Stephen Powell and Ken Baker

Grading

Homework 20%

Midterm Exam 30%

Final Exam 30%

Project 20%

Schedule

- Week 1
 - Introduction: Predictive, and Prescriptive Analytics
- Week 2-4
 - Mathematical optimization
- Week 5
 - Networks modeling
- Week 6
 - Multi-objective optimization
- Week 7
 - Stochastic modeling
- Week 8
 - PERT, (performance evaluation and review technique)
 - CPM, (critical path method)
- Week 9-10
 - Computer simulation
- Week 11
 - Decision and Risk analysis
 - Decision trees
 - Quantitative value function model
- Week 12-13
 - Forecasting models
- Week 14
 - Heuristic methods
- Week 15
 - Final exam