

Data Sciences and Operations

USC Marshall School of Business

DSO 499

Optimization with Analytics for Better Decision-Making

Spring 2022 (4.0 units)

Time: MW 12:00pm – 1:50pm

Professor Paat Rusmevichientong

Who should take the course?

Students who want exciting jobs that require advanced analytics! You will learn about "getting an edge" -- how to make effective decisions using data and models through optimization.

Optimization is used in virtually all business decisions. The skills and tools learned in this course will give you a unique analytics and competitive edge, and they can be applied to a broad range of careers, including finance, consulting, marketing, operations, and technology.

This course counts toward the USC Marshall **Business Analytics Emphasis!**

Course objectives

The course will teach students how to make effective decisions through optimization. Students will learn about optimization concepts and tools, and see how it can be applied to a broad range of applications. The class will provide students with extensive hand-on optimization practices.

Key Concepts

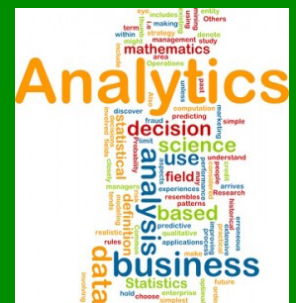
- Bayes' Rule
- Linear programming (LP)
- Shadow prices
- LP under uncertainty
- Multiperiod LP and dealing with large number of variables
- LP in finance and operations
- Nonlinear programming and applications to portfolio optimization
- Integer programming
- Dynamic optimization over time
- Applications in aviation, supply chain, manufacturing, and retail

Course description

You will learn how to translate a complex business problem into an optimization model by identifying appropriate decision variables, writing the objective function in terms of the decision variables, and developing constraints that capture the business requirements. After solving the optimization model, you will learn how to interpret the solution and extract key business insights to provide recommendations for better decisions.

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DSO



Optimization