DATA SCIENCES AND OPERATIONS
SPRING 2025

DSO 570 – *The Analytics Edge: Data, Models, and Effective Decisions*

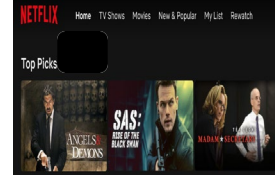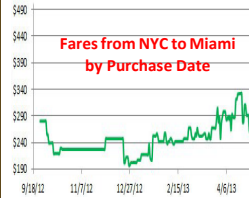**Thursday 6:30 - 9:30pm**

Section – 16283D (3 units)

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Optimization is used in virtually all business decisions!

Dynamic Pricing of Airfares

Developing Efficient Delivery Systems

Personalized Movie Recommendations

WHY TAKE THIS COURSE?

This course is designed for students who wish to go beyond the standard business analytics course! You will learn about "getting an edge" -- how to make effective decisions using data and models through optimization. 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.

COURSE OBJECTIVES

The course will teach students how to convert data into models, and most importantly, how to use the models 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

Linear programming (LP)
Shadow prices
LP under uncertainty
Multiperiod LP
Nonlinear programming
Integer programming
Dynamic optimization over time
Applications of optimization in aviation, supply chain, manufacturing, finance, and retail

COURSE DESCRIPTION

You will learn how to build models from data, and how to translate these models into effective decisions through optimization, providing you with a unique analytics and competitive edge. We will study four modules:

- Framework for effective decision-making
- Dealing with uncertainty: Fundamentals of probability
- From data to models: Building blocks of optimization
- Putting everything together: Effective decisions through optimization