ISYE 6610
Systems Modeling in Decision Science

Description
In this three credit, 15-week online graduate course, interpret decision science methodologies in the context of technical and business scenarios. Develop a conceptual understanding of these methods and associated implementation skills. With guidance from your instructor mentor, apply decision science methods to represent scenarios via systems models. Perform data development through mathematical formulation to achieve optimal results using computer solutions.

Projects

Project 1: Workload Balancing
Assume the role of production manager in a facility that manufactures color printers for professional and consumer markets. Consider the output of this multi-product environment to optimize profitability while satisfying customer demands. Perform an analysis to determine how many units of each printer should be produced as a result.

Project 2: Integer Linear Programming
In this project, assume the role of senior executive responsible for the company’s e-commerce sales. Develop a comprehensive plan to expand sales using a limited advertising budget. Create a model that will maximize the number of customers reached in one week of promotion, run the model, and perform a sensitivity analysis to support your recommended budget.

Project 3: Project Scheduling
Employ the Program Evaluation and Review Technique (PERT) and the Critical Path Method (CPM) to plan a warehouse expansion project. Develop a report that presents the project activity schedule and process flow with expected completion times, including considerations for probability and variance.

Project 4: Self-Selected Student Project
Given what is learned over the course of the semester, propose and complete an individual or team project addressing a business or engineering issue of your choice. Through this project, demonstrate your understanding of decision science methods introduced in the course.

Outcomes
Completion of the course enables you to:

- Use systems thinking to represent complex problems and prepare for analysis
- Apply commonly-used methods to aid decision making in a variety of contexts.
- Use software-based tools to provide analysis and recommendations
- Assess the applicability and limitations of decision science models when solving complex problems

Technology & Features
This course is offered through the Rensselaer Studio, providing ease of access to all course technologies and software required, any time, anywhere. Live, online synchronous sessions are scheduled every 2-3 weeks throughout the semester with the instructor and professionals from various industries also participating in this course. Sessions are designed to cultivate your understanding of course concepts and guide your approach as you gain insights from others’ experience.

Have questions about the course? Schedule a time to chat with Rensselaer