

Syllabus

Course description This course investigates the use of simulation as a decision-making tool, including explorations into what simulation is, how to use it, when its use is appropriate, and how to effectively communicate the results of a simulation model.

Course objectives In this course, we will study the use of simulation as a decision-making tool. By the end of this course, you will be able to: (i) create discrete-event simulations using JaamSim, (ii) use R to perform statistical tests to fit input data to probability distributions for use in simulation, (iii) use R to perform statistical tests to compare the output of simulations of alternate systems, (iv) apply these skills to analyze an existing real-world system of moderate complexity, and (v) write professional reports presenting your analysis.

These objectives aim to expand your repertoire of operations research tools, strengthen your ability to rigorously model and analyze complex problems, and develop your capacity to communicate technical ideas in an effective manner.

Textbooks Notes will be provided.

The following are the course topics along with the approximate weeks we will cover each topic:

Week	Topic
1	Introduction to discrete event simulation, performance measures, and JaamSim
2	Further JaamSim and output data analysis
3	RStudio and RMarkdown
4	Fitting data to distributions
5	Putting it together
6	Random number generation and variance reduction
7-8	Fantastic Dan
9-10	The Tube
11-12	Parking
13-15	Final project
16	Project presentations, Final review