

MIE1623: Introduction to Healthcare Engineering

Instructor: Prof. Dionne Aleman, MC321, aleman@mie.utoronto.ca
Prof. Mike Carter, RS311, carter@mie.utoronto.ca

Teaching Assistant: TBA

Office hours: TBA

Textbook: none

Prerequisites: APS1005 or basic OR background recommended.

Students who do not have a background will be required to do some extra reading on some topics available on the website.

Lectures: Wednesday 17:10 - 20:00

First class: January 13, 2021

Course description

This course illustrates the use of industrial engineering techniques in the field of healthcare. Common strategic, tactical, and operational decision-making problems arising in healthcare will be approached from an operations research perspective. Unique aspects of healthcare compared to other industries will be discussed. Real-world datasets will be provided to illustrate the complexity of applying standard operations research methods to healthcare.

Course goals

- Learn to recognize healthcare problems that can be solved with OR
- Learn important metrics that must be considered in healthcare
- Learn to balance competing objectives and stakeholders
- Learn how to assess efficiency in healthcare systems

Grading

Assessment	Weight	Date
Homework (5 assignments, 12% each)	60%	See schedule of topics
Project	35%	Wednesday, April 7
Project presentation	5%	Wednesday, April 7

Schedule of topics: The schedule of topics below is subject to change without notice.

Week	Date	Lecture	Due
1	Jan 13	Intro to course; Facility location and layout	
2	Jan 20	Waitlist management, staffing, forecasting	
3	Jan 27	Health and human resources; System Dynamics	Assignment 1
4	Feb 3	Excel-based DSS	
5	Feb 10	Public Health Policy; Decision Analysis	Assignment 2
6	Feb 17	Surgical, shift and appointment scheduling	
7	Feb 24	READING WEEK	
8	Mar 3	Staffing assignments, queuing theory	Assignment 3
9	Mar 10	Patient flow, supply chain, simulation, related software	
10	Mar 17	Benchmarking	Assignment 4
11	Mar 24	Case mix planning; Goal Programming	
12	Mar 31	Resource management, capacity planning	Assignment 5
13	Apr 7	Project presentations	Project