

OPNS 951 Operations for Social Impact

Winter 2024

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Class Time	M/Th 1:30–3:00

COURSE DESCRIPTION AND OBJECTIVES

The rise in data availability and analytics capabilities has revolutionized the way nonprofit and humanitarian organizations engage in their social impact work. In this course, we will explore the challenges and opportunities for social impact in the age of analytics through the lens of operations management. While the ultimate goals of the organizations we study focus on achieving broad social impact, we will consider how improved operational decisions can facilitate greater impact. Students will explore the links between operational decisions and the mission outcomes of an organization. As one example, we will study how operational decisions related to the scheduling of patients for a mobile health care provider can impact the organization's ability to increase access to healthcare for children with asthma.

Students will work in teams on a series of case studies and in-class exercises that range in topic from advanced technology for disaster response and preparedness to improved decision-making frameworks for community-based health care providers. To assist in the understanding of these complex settings, the course will include guest speakers from local and national organizations who will discuss recent innovations in operations for social impact. Class discussions and related assignments will focus on the development of quantitative models and tools to inform operational decisions that efficiently use limited resources and ultimately expand the capacity of organizations to achieve their missions.

CO-REQUISITE

Operations Management (OPNS-430-0) is a co-requisite (concurrent enrollment is permissible).

COURSE REQUIREMENTS

The class will be divided into two modules: (1) Operations management in public and community services and (2) Operations management in humanitarian logistics and global health. Each course module will include a series of case studies and in-class modeling and simulation exercises. The Kellogg Honor Code applies to all assignments (<https://www.kellogg.northwestern.edu/policies/honor-code.aspx>). Importantly, for team assignments, all students listed on a team are expected to contribute meaningfully to each assignment. If you have not contributed to the team, you are expected to submit an individual report.

CASE STUDIES, IN-CLASS EXERCISES AND RELATED READINGS

Each module will be accompanied by a series of case studies and in-class exercises (some individual and some team assignments). The exercises will involve computer-based modeling and simulation activities. Each case study will include an individual pre-class quiz. Related reading material and computer files will be posted prior to class on Canvas.

CLASS PARTICIPATION

This course involves in-depth discussions of the connection between operations management and pressing societal issues. As such, it is critical that we follow the Kellogg Classroom etiquette policy to foster open discussion (<https://www.kellogg.northwestern.edu/policies/etiquette.aspx>). Students are expected to arrive on time for class and the use of smart phones or other devices for texting, e-mail etc. is prohibited. Students can find useful resources for safety and security, academic support, and mental and physical health and well-being on the NU help [website](#) or [app](#).

FINAL EXAM

There will be a closed book final exam, focusing on concepts from the course.

COURSE ASSESSMENT

1. Case studies (40% total).
 - Pre-class quiz(10% each)
 - Project report (25% each)
 - Team (peer) assessment (5%)
2. In-class exercises (25% total).
 - Pre-class quiz (5% each)
 - In-class exercise (15% each)
 - Team (peer) assessment (5%)
3. Class participation (20%).
4. Final exam (15%).

COURSE PLAN

Week	Date	Discussion	Case studies
<i>Introduction to Operations for Social Impact</i>			
W1	3-Jan	Course overview	<i>Robin Hood Foundation</i>
	4-Jan	Measuring impact	
W2	8-Jan	Linking operations to impact	<i>Riders for Health</i>
	11-Jan	Modeling equity	
<i>Nonprofit and Public Sector Operations</i>			
W3	17-Jan	Operations in public schools	<i>Denver Public Schools</i> Guest speaker
	18-Jan	Innovation in school operations	
W4	22-Jan	Social enterprise operations	<i>World Tailors</i> Guest speaker
	25-Jan	Innovation in social enterprise operations	
W5	29-Jan	Operations and health outcomes	<i>Mobile CARE Foundation</i>
	1-Feb	Linking operations to uncertain outcomes	
W6	5-Feb	Operations in public services	Guest speaker
	8-Feb	When operations, policy and politics meet	
<i>Humanitarian and Global Health Operations</i>			
W7	12-Feb	Humanitarian logistics	<i>Big Depot simulation</i>
	15-Feb	Decisions before disasters strike	
W8	19-Feb	Better decisions before disasters strike	<i>The Kampala Alternative</i>
	22-Feb	Operations under uncertainty	
W9	26-Feb	Global health operations	<i>Infant HIV Diagnostics</i>
	29-Feb	Designing tools for social impact	
W10	4-Mar	Innovations in global health	Guest speaker
	7-Mar	Course wrap-up	
Final exam			

Weeks 1 & 2: Introduction to Operations for Social Impact

The course will begin with an overview of critical issues in humanitarian and nonprofit operations with a focus on three main themes: (1) identifying and understanding unique features in these settings when social impact is paramount to profit; (2) identifying and understanding links between operational decisions and the mission of an organization; and (3) developing quantitative tools to analyze and inform operational decisions of an organization.

WEEK 1

- **Readings**

Challenges and strategies in managing nonprofit operations: An operations management perspective, Gemma Berenguer and Zuo-Jun Shen

Adventures in policy modeling! Operations research in the community and beyond Edward Kaplan

Humanitarian aid logistics: supply chain management in high gear Luk Van Wassenhove

- **Case study**

The Robin Hood Foundation, Alnoor Ebrahim and Catherine Ross

WEEK 2

- **Case study**

Riders for Health: Health Care Distribution Solutions in Sub-Saharan Africa, Hau Lee and Brian Tayan

- **Between-class exercise**

Allocating scarce resources: identifying what matters

- **In-class exercise**

Modeling equity in operations management: how to choose when some will lose

- **Readings**

Equity measurement in facility location analysis: A review and framework Michael Marsh and David Schilling

The price of fairness Dimitris Bertsimas, Vivek Farias, and Nikolaos Trichakis (Skimming through the proofs is perfectly acceptable.)

Weeks 3 - 6: Nonprofit and public sector operations

We will study nonprofit operations with a focus on public and community-based services.

WEEK 3

- **Case study**

Re-Envisioning Food Services in the Denver Public Schools, Karen Smilowitz, Micah Joselow, and Mariana Escallon Barrios

- **Readings**

Optimizing schools' start time and bus routes D. Bertsimas, A. Delarue, and S. Martin

WEEK 4

- **Case study**

World Tailors: Stitching Together a Plan for Growth, Robert Klassen and Kelsey Taylor

WEEK 5

- **Case study**

Mobile C.A.R.E., Sarang Deo, Karen Smilowitz, Theppan Asvatanakul, John Scheinesson, Kerry Stuewer, Jason Kim, and Steven Samuelson

- **Readings**

Geographic variability in childhood asthma prevalence in Chicago, Ruchi Gupta, Xingyou Zhang, Lisa Sharp, John Shannon, and Kevin Weiss

WEEK 6

- **In-class discussions**

Week 6 is a reflection week in which we focus on pressing societal issues in Evanston through the lens of operations and prior class topics

- **Readings**

Note -these are long books - you are next expected to read them in this week, but I highly recommend to read at some time

Despite the best intentions: How racial inequality thrives in good schools, Amanda Lewis and John Diamond

Friends Disappear: The Battle for Racial Equality in Evanston, Mary Barr

Weeks 7-10: Humanitarian and global health operations

We will study humanitarian operations with a focus on disaster preparedness and response and global health care provision.

WEEK 7

- **Case study**

A Leader Home Improvement Retailer Commitment to Disaster Response, Ozlem Ergun, Gonca Karakus, Paul Kerl, Pinar Keskinocak, Julie Swann, Monica Villarreal, and Matthew Drake

- **Readings**

Pre-positioning of emergency items for CARE International, Serhan Duran, Marco Gutierrez, and Pinar Keskinocak

WEEK 8

- **Case study**

The Kampala Alternative: Optimizing the Humanitarian Supply Chain in East Africa, Marie-Ève Rancourt, Émilie Dufour, Selene Silvestri and Yossiri Adulyasak

WEEK 9

- **Case study**

Infant HIV Diagnostics: Supply Chain in Sub-Saharan Africa, Sarang Deo, Avidan Ben Har, Bill Shields, Mihir Naware