

**APS1005H: Operations Research for Engineering Management
Summer 2017**

Course Description: This course introduces optimization techniques applicable in solving various engineering problems. These techniques are widely used in engineering design, optimal control, production planning, reliability engineering, and operations management. The contents of this course can be classified into two major categories: Modeling techniques (week 1) and Optimization algorithms (week 2). Topics include linear programming, network programming, integer programming, dynamic programming, and decision making under uncertainty. Widely available software will be used for numerically solving linear, network and integer programming models.

Exclusion **MIE262 or equivalent**

Lecturer: Daniel Frances (frances@mie.utoronto.ca)

References: 1. Operations Research - Applications and Algorithms by Wayne L. Winston, 4th Edition. 2004
2. Practical Management Science, by W.L. Winston and S. Albright, 5th Edition. 2014

Course Duration and Format: This is an intense synchronous on-line 9-day course that requires full time participation. Video lectures are posted daily August 8th-11th and 14th-18th. Students are expected to do problems between and after video postings, and to participate in the daily 4-5 pm EST tutorial session in person. Remote students will be able to participate in the daily tutorials through the internet in real time. Students submit a daily assignment online due by the end of each day, and write an in-person final exam 9-12 Tuesday August 22nd. It is not recommended that students take this course while working.

Required Software to Complete Assignments: Microsoft Excel with Solver Add-In.

Daily Tutorials: 4-5 pm in RS211 (Online access for remote students)

Marking:	Daily Assignments (Submitted online)	40%
	Partnering (Requires Webinar attendance)	10%
	In-person Final Exam 9-12 Aug 22nd	50%

Day	Date	Topic	Ref*
1	08-Aug	Linear Programming (LP) Formulations & Software	1,3/1-4
2	09-Aug	Network Problem (NP) Formulations & Software	7,8/5
3	10-Aug	Integer Programming (IP) Formulations & Software	9/6
4	11-Aug	Dynamic Programming Formulations and Algorithm	18/-
	12-Aug		
	13-Aug		
5	14-Aug	LP Solution Algorithm	4/-
6	15-Aug	LP Postoptimality Analysis	5,6/-
7	16-Aug	NP Solution Algorithm	8/-
8	17-Aug	IP Solution Algorithm	9/-
9	18-Aug	Decision Analysis	13/9
	22-Aug	Final Exam	

* Chapter references shown are from Reference 1 / Reference 2.