

## APS1005S: Operations Research for Engineering Management Summer 2018

**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. It is not recommended that students take this course while working. Video lectures are posted daily August 7<sup>th</sup>-10<sup>th</sup> and 13<sup>th</sup>-17<sup>th</sup>. Students are expected to attend the daily opening webinar, do problems during and after video postings, participate in the daily 4-5 pm EST tutorial session (vide recorded for remote students), submit a daily assignment online by the end of each day, and write an in-person final exam 9-12 Tuesday August 21st.

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

**Daily Tutorials:** 4-5 pm in TBA (Video Recorded for remote students)

<b>Marking:</b>	Daily Assignments (Submitted online)	40%
	Opening Webinar Attendance	10%
	In-person Final Exam 9-12 Aug 21	50%

### Teaching Assistants

TBA  
TBA  
TBA

Day	Date	Topic	Ref*	Piazza	Marking
1	07-Aug	Linear Programming (LP) Formulations & Software	1,3/1-4	TBA	TBA
2	08-Aug	Network Problem (NP) Formulations & Software	7,8/5	TBA	TBA
3	09-Aug	Integer Programming (IP) Formulations & Software	9/6	TBA	TBA
4	10-Aug	Dynamic Programming Formulations and Algorithm	18/-	TBA	TBA
	11-Aug				
	12-Aug				
5	13-Aug	LP Solution Algorithm	4/-	TBA	TBA
6	14-Aug	LP Postoptimality Analysis	5,6/-	TBA	TBA
7	15-Aug	NP Solution Algorithm	8/-	TBA	TBA
8	16-Aug	IP Solution Algorithm	9/-	TBA	TBA
9	17-Aug	Decision Analysis	13/9	TBA	TBA
	21-Aug	Final Exam			

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