MIE1605H: Stochastic Processes (Fall 2019)

- **Instructor:** Prof. Vahid Sarhangian, Office: BA8108, Email: sarhangian@mie.utoronto.ca
- **Office hours:** TBD in class.
- **Lectures:** Tuesdays (3:00-6:00PM) in MC 306.

Course description and prerequisites

Introduction to fundamental probabilistic models with emphasis on applications to queueing theory and service Engineering. Tentative topics include discrete Markov chains, Poisson process, Markov processes, renewal theory, Martingales, and Brownian motion.

The course is designed for graduate research students. MEng students require permission from the instructor to enrol in the course. Students are expected to have a strong undergraduate (non-measure theoretic) level background in probability at the level of MIE231 or STA347, or equivalent. It is recommended that the students take MIE1613 (Stochastic Simulation) before this course.

Textbook and additional references

Notes will be provided in class. The main reference for the course is Durrett (2012) which is available online on the publisher's website and here.

- R. Durrett (2012) Essentials of stochastic processes. Springer, New York.

Some of the topics and applications will be based on the following texts, which are also useful sources for supplementary readings.

- J.S. Rosenthal (2006), A first look at rigorous probability theory. World Scientific Publishing Company, Singapore.
- C. Hong, and D. Yao (2013) Fundamentals of queueing networks: Performance, asymptotics, and optimization. Vol. 46. Springer Science & Business Media.

Evaluation

The evaluation will be based on assignments, a mid-term test, and a final project. Details and deadlines to be announced in class.