Syllabus for MATH 6150I (Spring 2020)
Combinatorics of Crystal Bases

Instructor:	Eric Marberg, eric.marberg@gmail.com Office: Rm 3492 in Math Department, Lift 25-26
Lectures:	Wednesdays and Fridays, 1:30 PM to 2:50 PM
Website:	http://www.math.ust.hk/~emarberg/teaching/2020/Math6150I/
Office hours:	See website.
Prerequisites:	MATH 5143 (Lie algebras) Some exposure to root systems, Weyl groups, and Coxeter systems would be helpfull, but is not strictly necessary.
References:	Crystal Bases: Representations and Combinatorics by Bump and Schilling Introduction to Quantum Groups and Crystal Bases by Hong and Kang
Outline:	Crystal bases are discrete objects that encode useful structure in representations of Lie algebras. This topics course will develop the theory of crystal bases in a self-contained way from a combinatorial point of view. Our ultimate goal is to see how crystals arise in the representation theory of quantum groups. As we investigate the theory, we will survey several important classical topics in algebraic combinatorics, such as Young tableaux, insertion algorithms, the Littlewood- Richardson rule, and Stanley symmetric functions. The course will be accessible for first year graduate students with some exposure to abstract algebra that are interested in algebraic combinatorics or representation theory.
Grading:	Homework assignments every 1-2 weeks