Spring 2020, Math 3343 – Combinatorial Analysis

Instr/Tutor	Office	Lecture/Tutorial Hour	Venue
Chen, Beifang email: mabfchen	Rm 3438	TueThur, 10:30am-11:50am Office hours: Wed, 4-6pm	Rm 4502 Lift 25-26
Chan, Wa Fai email: mawfchan	Rm 3213	Mon, 9:00am-9:50am Office hours: Mon 4-6pm	Rm 1151 Lift 27-28

Textbook: **Introductory Combinatorics** (4th edition)
Author: Richard A. Brualdi
Press: Prentice Hall

Combinatorics has its roots in mathematical recreations and games; it dates back to ancient Chinese He Luo Tu. Many problems that were studied in the past, either for amusement or for aesthetic appeal, are of great importance today in pure and applied science. Now combinatorics is an important branch of mathematics, and its influence continues to expand. Part of the reason for the tremendous growth of combinatorics since the sixties has been the major impact that computers have had and continue to have in our society. Another reason for the recent growth of combinatorics is its applicability to disciplines that had previously had little serious contact with mathematics. It is often found that the ideas and techniques of combinatorics are being used not only in the traditional areas of mathematical application, namely, the physical sciences, but also in the social sciences, the biological sciences, information theory, and so on.

Combinatorics is concerned with arrangements of the objects of a finite set into patterns satisfying certain specified rules.

This course is intended for undergraduates who have taken Math2343 or elementary course of linear algebra. For students who did not take the above courses or similar ones, they are assumed to have reached certain level of mathematical maturity.

Topics: Pigeonhole principle; counting; inclusion-exclusion principle; generating function method; partially ordered sets; Möbius inversions; combinatorial design; Pólya counting, etc.

References: R. Merris, *Combinatorics*, PWS Publishing Company, 1996.
J. Riordan, *An introduction to combinatorial analysis*, John Wiley & Sons, 1958.
J. H. van Lint & R. M. Wilson, *A course in combinatorics*, Cambridge University Press, 1992.

Advanced books
R. Stanley, *Enumerative combinatorics*, Cambridge University Press, 1991.
Jr. M. Hall, *Combinatorial theory*, John Wiley & Sons, 1986.
M. Aigner, *Combinatorial theory*, Springer, 1979.

Grading policy: Homework counts 15%; there is one midterm (counted 35%) and one final (counted 50%).