Complex Analysis – MATH 220 A/B/C

Topics for 2025 Qualifying Exam

Math 220A:
Conway, Functions of One Complex Variable, Chapters I - IV.6.

Math 220B:
Conway, Chapters IV.7- VIII, except for VI.3, VI.4, VII.3, VII.7, VII.8.

Topics from 220B:
The open mapping theorem
Goursat's theorem

Isolated singularities. Removable singularities theorem.
Poles. Meromorphic functions. Essential singularities. Casorati-Weierstrass
Residues. The residue theorem with applications
The argument principle
Rouche's theorem

The maximum modulus theorem
Schwarz's lemma
Automorphisms of the unit disc

Space of analytic functions and convergence in this space. Hurwitz's theorem. Normal families and Montel's theorem
Riemann Mapping Theorem

Infinite products of holomorphic functions
The Weierstrass factorization theorem
Factorization of the sine function

Runge's theorem. Polynomial and rational approximation
Characterization of simply connected regions
Mittag-Leffler's theorem

Math 220C:
Conway, chapters X, XI, except for X.5.