Syllabus of Math 5181

(1) neighborhoods, bases, and subbases, closure operator
(2) countability, linear orders and topology, well-ordering
(3) subspaces, products, continuous functions, weak topologies
(4) sequences, nets, and filters
(5) separation axioms and preservation properties
(6) completely regular, normal spaces, Urysohn's lemma
(7) countability properties, Urysohn's metrization theorem, Tietze extension theorem
(8) standard examples like irrationals, Sorgenfrey line and plane, lexicographic square, Tychonoff plank, Alexandroff double, double arrow.
(9) compact spaces, locally compact spaces, compactifications
(10) products of compact, countably compact, normal spaces,
(11) metrization, complete metric spaces, the Baire Theorem,
(12) connectedness, local connectedness, continua, path-connected, components
(13) Cantor set, totally disconnected spaces
(14) Tychonoff's theorem.