

Comprehensive Exam Syllabus: MATH 6540 (General Topology)

Graduate Program in Mathematics and Statistics, York University

WINTER 2019

Topics

The General Topology Comprehensive Examination during the Winter 2019 semester may cover the following topics:

1. Topological Spaces
Topological spaces, open sets, metric spaces, basis for a topology, closed sets, nets, limit points, boundary points, closures of sets, interior of sets, Hausdorff space
2. Continuous Functions
Continuous functions, homeomorphisms, connected sets, Intermediate Value Theorem, path, path connected, locally connected
3. Compactness
Compact space, Heine-Borel, Extreme Value Theorem, limit compactness, local compactness, finite intersection property, one-point compactification
4. Function Spaces
Compactness in metric spaces, Ascoli's Theorem, Stone-Weierstrass Theorem
5. Some Big Theorems
Tychonoff's Theorem, Baire Category Theorem, countability axioms, separation axioms, normal spaces, Urysohn's Lemma, Tietze Extension Theorem, Stone-Cech Compactification
6. Metrizations
Urysohn's Metrization Theorem, Local Finiteness, Nagata-Smirnov Metrization Theorem, paracompactness, Smirnov Metrization Theorem

Textbook

The reference textbook for this examination is *Topology* by Munkres (2nd edition). Students attempting this comprehensive examination should be familiar with the topics listed above as presented in Chapters 1-8. Alternatively, students can view the course notes and assignments for MATH 6540 to be found at <http://pskoufra.info.yorku.ca/teaching/w2019-math6540/>.

Grading

The three-hour comprehensive examination will consist of 8 questions each worth 10 points for a total of 80 points. A student is required to obtain a score of 48 points or greater (i.e. 60%) to pass the comprehensive examination. For students enrolled in MATH 6540, the final examination component of their grade will be computed as a score out of 60.