Math 8750: Topology of Manifolds, Fall 2019

Syllabus

INSTRUCTOR: Slava Krushkal (KER 321), e-mail: krushkal@virginia.edu

CLASS MEETINGS: NWF 12 - 12:50, Monroe Hall 114.

OFFICE HOURS: Wednesday 2:30 - 4, and by appointment.

Prerequisites: One semester of Differential Topology (such as Math 7820) and one semester of Algebraic Topology (such as Math 7800) are a sufficient background for this course.

Course material: The main goal of the class is to give an introduction to geometric and quantum topology in low (2, 3, 4) dimensions, with the focus on topics not covered in similar courses in recent years. Specific topics that will be discussed include handle decompositions; the Whitney trick and its failure in 4 dimensions; its analogues in 3-dimensions: the Dehn lemma and the loop theorem; Milnor's invariants for classical links; various special 2-complexes important if 4-manifold topology: Casson towers, Whitney towers, capped gropes; Heegaard splittings and trisections of 4-manifolds; Khovanov homology and other aspects of categorification.

Homework: Homework will be assigned on a regular basis.

The course grade will be determined by class participation and homework.