The Graduate Center of CUNY

Ph.D. Program in Mathematics

Course Description

Spring 2022

Course Title: Topology and geometry in low dimensions

Course #: 82600

Day & Time: Tuesday, 11am-1pm

Instructor Name: Prof. Dennis Sullivan

Contact Information: Will be given in class

Prerequisites: Desire to understand

Office Hours: Mondays from 2-6p (on the weeks that I teach in person the following day)

Mode: ○ In Person ◉ Hybrid

Course Description (If Hybrid, include details on when in person vs. remote

This is a search for geometric structures on manifolds defined by transition mappings with a continuation property. The continuation property directly implies the structure is induced by a local diffeomorphism of the universal cover into a model space. This in turn means the structure is essentially determined by a geometric representation of the fundamental group.

A strengthening of the Thursston geometrization picture for 3 maniofolds is the statement that: with certain non prime exceptions, closed three manifolds have these structures. The ideas and lie groups that appear in this discussion reach into dimension four and higher. These hints are being pursued in the attempt to deal with the exceptions. They also suggest directions of research for higher dimensional manifolds.

The first class (2/1/22) will be in person. The second (2/8/22) will be on zoom. And they will continue to alternate as such throughout the semester.