



Texas State Topology Seminar

Tuesday, 2017, October 10, 12:30-1:50 p.m., in ENC (HPB) 143

Speaker: Will Grilliette

Topic: *Normed Tensor Products*

ABSTRACT

This talk discusses a peculiar issue arising in functional analysis. Given two vector spaces, there is a unique algebraic notion of a tensor product, which is a left adjoint to an appropriate internal hom-functor. Said another way, the hom-tensor adjunction is a closed monoidal structure on the category of vector spaces.

However, given two normed vector spaces, there are several infinite families of norms compatible with the algebraic tensor product. Not only are these norms not simply scalar multiples of each other, but also their induced topological spaces are not even pairwise homeomorphic for infinite-dimensional spaces. Of these families, one specific norm gives rise to a corresponding hom-tensor adjunction, the projective tensor norm.

The talk will focus primarily on the injective and projective tensor norms, as well as concrete examples that demonstrate their respective behaviors.

Students will find this talk interesting as it incorporates abstract algebra, real analysis, and measure theory in a way that will be of use to those interested in applied mathematics as well.