



Catalog Description:

This course will serve as an introduction to algebraic topology, with a view toward persistent homology of point clouds for applications to data analysis. Homology of simplicial complexes over a field with a focus on building up intuition about homology moving to a specialized notion of persistent homology of persistence modules. Real-world applications to data analysis will be provided.

Prerequisite:

C- or better in 2568 and 3345.

Text:

In-house course notes: Introduction to Applied Algebraic Topology by Tom Needham

<https://drive.google.com/file/d/1SCrKHfZdDuMmSKIZ7xveQT8SqBHjFEkk/view>

Topics List:

1. Review of Linear Algebra
2. Metric Topology
3. Homology of Simplicial Complexes
4. Point Clouds and Associated Spaces
5. Persistent Homology
6. Persistence Diagrams
7. Structures on the Space of Barcodes
8. Applications