Course Outline
Department of Mathematics
and Statistics
Minnesota State University, Mankato

Math 402 Introduction to Topology (4 semester hours)

Course Description:

An introduction to topological spaces and their fundamental properties such as compactness, connectedness, separation properties and countability properties. Continuous functions between topological spaces and common examples of topological spaces are also discussed.

Prerequisites: MATH 290 with grade of “C” (2.0) or higher.

Learning Outcomes:

1. Students will learn about the mathematical concept of topological spaces and their features.
2. Students will use properties of topological spaces to contrast different topological spaces.
3. Students will use continuous functions between topological spaces to analyze the properties of those spaces.
4. Students will apply topological methods to simplify problems in other areas of mathematics.

Content Outline:

1. The definition and concept of abstract Topological Spaces.
2. Properties of topological spaces, including compactness, connectedness, separation properties (such as the Hausdorff condition) and countability properties.
4. Common examples of topological spaces and constructions on topological spaces, such as discrete spaces, product spaces, quotient spaces and metric spaces.

Textbook/Related Readings/Materials:

Crossley, Essential Topology
Janich, Topology
Kinsey, Topology of Surfaces
Firby, Surface Topology
Carlson, Topology of Surfaces, Knots, and Manifolds