MATH 541 Topology II

1. Catalog Description

MATH 541 Topology II **4 units**

Prerequisite: MATH 440 or MATH 540.

Introduction to general topological spaces with emphasis on surfaces and manifolds. Fundamental group. Triangulations of spaces, classification of surfaces. Other topics may include covering spaces, simplicial homology, homotopy theory and topics from differential topology. 4 lectures. Not open to students with credit in MATH 441.

2. Required Background or Experience

Math 540 and graduate standing. Math 304 recommended.

3. Learning Objectives

The student should:

a. Be able to define and use the fundamental group.
b. Develop facility with triangulations of surfaces.
c. Understand the classification of surfaces.

4. Text and References

To be chosen by the instructor.

5. Minimum Student Materials

Paper, pencils and notebook.

6. Minimum University Facilities

Classroom with ample chalkboard space for class use.

7. Content and Method

Topics

Algebraic, geometric or differential topology, which may include:

a. Fundamental groups and covering spaces
b. Simplicial or singular homology
c. Classification of Surfaces, Euler characteristic
d. 3 – Manifold topology
e. Differentiable manifolds

f. Sard's Theorem
g. Degree Theory
h. Poincare-Hopf Theorem and applications

8. Methods of Assessment

Exams, homework, and possibly student presentations.