

## The Senior Thesis

Students in the Honors Mathematics Program have the option of writing a Thesis on a subject in Mathematics. This project is intended to give the student a better sense of how mathematics is done and to develop in the student the habit of learning mathematics in an independent setting. This work would be expected in most cases, to be expository, but based on graduate level readings. It should represent an effort that goes beyond what is found in an undergraduate course. It is especially desirable for a student to present a somewhat novel approach to an established subject.

During the second semester of the junior year, and the first semester of the senior year, the student will work closely with a faculty advisor on a program of readings in preparation for the thesis. The student will receive 1 credit each of these two semesters for this work, under Math 46-800 (Directed Readings). If the student is working on the thesis as part of the Arts and Letters/Science Honors Program, academic credit for the work is awarded by the Department of Mathematics and not by the Honors Program.

The thesis is to be crafted and completed during the second semester of the senior year. The thesis must be submitted to the Director of Undergraduate Studies by April 15 of the senior year. The signature of the faculty advisor is required on the finished thesis. It will then be examined by the Committee Undergraduate Studies of the Mathematics Department. If the thesis is approved, the student will receive 1 credit under Math 48-900 (Undergraduate Thesis).

If approved by this committee, the Thesis will fulfill the requirements for the citation of "Graduation with Senior Thesis".

While there is no stipulation concerning the minimum number of pages for this work, the Thesis should demonstrate a mature understanding of its subject, and should be a logical and articulate presentation of the mathematical topic chosen.

The student should choose an advisor from the Mathematics faculty before, or during, the first semester of the junior year, and develop, with this faculty member, a list of readings required for the thesis, as well as a clear idea of the topic. It is generally expected that by the beginning of the second semester of the Junior Year, the student will have announced to the Director of Undergraduate Studies that he or she plans to write a Thesis, and provide the name of the faculty advisor.

In past years, students have written undergraduate theses on the following topics, among others:

Classification of Complex Simple Lie Algebras; Characteristic Classes and  $Spin^c$  Structures; The h-Cobordism Theorem; Minkowskian Geometry and General Relativity; Chern Classes of Vector Bundles; Representations of Symmetric Groups; The Theory of Affine Connections; Hyperelliptic Riemann Surfaces; Finite Coxeter Groups; Coding Theory; Modal Logic, Systems Theory and Games; A modern proof of Bieberbach's Theorems on Crystallographic Groups.