Program Cover Document — MAT 494: Independent Study in Mathematics II

I. Course Overview

Currently, MAT mathematics courses have numbers indicating the course’s level of mathematical sophistication. Roughly, MAT 1xx courses are aimed at a first-year student level, MAT 2xx courses at a sophomore level, MAT 3xx courses at a junior level, and MAT 4xx courses at a senior level. It is expected that the level of mathematical maturity expected of students increases with each stage. The MATA liberal arts mathematics major uses this numbering system by requiring students to take a certain number of courses at the MAT 3xx and MAT 4xx level, respectively, to graduate. The recently introduced MATA honors program also uses this numbering system.

Presently, the undergraduate course bulletin lists an independent study course, MAT 391: Independent Study in Mathematics and two independent research courses, MAT 393: Independent Research in Mathematics and MAT 493: Independent Research in Mathematics II. The different numbers for the two research courses indicate the differing levels of work and sophistication involved in the research. There is a similar need for the MATA major to have a second independent study course at the 400-level for students studying very advanced material but who are not doing research.

In MAT 494: Independent Study in Mathematics II, students who have found a willing faculty member will be able to study advanced material on their own. Any area of mathematics would be suitable as a choice of topic for this course. It is also expected that there may be multiple sections of the course offered each semester, with different students working with different professors. Because of the advanced material and the difficulty of independent study, the department will require students to have a 3.3 GPA in their mathematics courses.

II. Learning Goals

The student will gain mastery of the subject matter studied. The student will gain mathematical maturity through the study of an advanced mathematical topic. The student will demonstrate increased sophistication in the writing of proofs and will show increased proficiency in the oral presentation of mathematical concepts.

III. Student Assessment

The method for student assessment will be decided by the professor in charge of the course. In addition to regular homework assignments, it is expected that either an oral presentation or a final project will be required at the end of the course.

IV. Learning Activities

In an independent study course, the primary learning activity will be the study of mathematics from a textbook or suitable articles. Discussions between the faculty member and the student are also an important learning component. In addition, student lectures or presentations may be required by the professor to facilitate learning.
Departmental Course Syllabus – MAT 494: Independent Study in Mathematics II

I. Basic Information
A. Purpose statement: Students are often interested in studying areas of mathematics that are not currently being taught in the department's course offerings. MAT 391: Independent Study in Mathematics enables students to learn moderately advanced material independently under the supervision of a faculty member. MAT 494: Independent Study in Mathematics II would offer students a similar opportunity to study more advanced material.

B. Course description: The course allows students to study advanced mathematical topics independently under the supervision of a faculty member.

C. Course prerequisites: A 3.3 GPA in mathematics courses and permission of the supervising faculty member.

II. Learning Goals
A. Content goals: Students will be knowledgeable about an area of advanced mathematics.

B. Performance goals: The student will demonstrate mastery of the subject matter studied. The student will gain mathematical maturity through the study of an advanced mathematical topic. The student will show increased ability to learn mathematics through the reading of a textbook or research articles. The student will demonstrate increased sophistication in the writing of proofs and will show increased proficiency in the oral presentation of mathematical concepts.

III. Student Assessment
A. Assessment plan: Regular written homework assignments and/or oral presentations are expected, as well as a final comprehensive in-class exam or project.

B. Rationale: The ability to demonstrate one's mathematical understanding through written and oral assignments is an essential skill for a mathematician. Students learning very advanced material are usually considering graduate school where success is often dependent on good written and oral skills.