

MAT 493: Independent Research II in Mathematics

I. Basic Course Information

MAT 493: Independent Research II in Mathematics is an upper level course in which students engage in advanced work that goes beyond learning what other mathematicians have done. In addition to gaining background knowledge in the field through reading, students will engage in experimentation to elucidate an open problem, for example by exploring new, nontrivial examples; performing significant, novel computations; developing mathematical models; developing conjectures; or proving new theorems.

Students work in collaboration with a faculty member and/or with fellow student researchers and a faculty mentor. The student will be expected at the end of the semester to write a paper which will be presented to the department or at a mathematics conference. To register for the course a student must make arrangements with a faculty member of the department who agrees to serve as a mentor of the independent research. Students must have a 3.0 GPA in their math courses to register for the course.

Prerequisites: Two completed MAT courses at the 300- or 400-level. While the research activities need not draw directly on prerequisite course material, the work undertaken by the student will draw upon the student's mathematical maturity.

Enrollment Process: The faculty mentor and the student will write a proposal explaining the subject matter that will be studied as well as the way the student's work will be assessed. An independent research contract/enrollment form must be prepared by the student, approved by the faculty mentor and the department chairperson, and submitted to the Office of Records and Registration at the time the student registers for the course. Registration for independent research will be accepted only through the first week of the semester.

Limitation on Number of Independent Work Courses: At most one course unit of Independent Study, Guided Study, or Independent Research may count as one of the Mathematics or Statistics options for a major. The total course load of a student taking Independent Study, Guided Study, or Independent Research should be at most 4.5 course units. Independent Study, Guided Study, or Independent Research courses may not be taken in order to improve a grade, or to replace a course that a student failed to sign up for.

II. Learning Goals

- a. A deep understanding of some selected topics in mathematics
- b. To enhance a student's ability to solve difficult problems in a certain area in mathematics
- c. To improve a student's ability to read and write mathematics
- d. To improve a student's ability to conduct literature searches in the discipline.
- e. To improve a student's ability to communicate orally their results.

III. Student Assessment

Students will meet with their faculty mentor on a weekly basis. They will be assessed, by the faculty mentor, based on their weekly progress. At the end of the semester students must submit their results in a paper that they will present to the department or at a mathematics conference.

IV. Learning Activities

The learning activities will be decided by the faculty mentor. They will be specified in the original proposal submitted to the department chairperson for approval.

Approved: 5/2008
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