

Program Cover Document --- MAT 407: Projective Geometry

I. Basic Course Information

MAT 407: Projective Geometry is primarily a senior level course. It is scheduled for two 80-minute meetings each week. Its prerequisite is MAT 305.

II. Learning Goals

The primary goal of MAT 407: Projective Geometry is a subject which will make it possible for seniors math majors to put together four different areas of mathematics: Linear Algebra, Abstract Algebra, Complex variables and Geometry.

Topics are chosen to cover historically important problems in projective geometry, and to give an understanding of the subject's historical development. The course will help students realize the connections between two very basic disciplines, Abstract Algebra and Geometry.

An additional learning goal of Projective Geometry is the further development of both a student's abstract reasoning ability and a student's ability to read, write, and understand proofs. The level of proofs in projective Geometry is at a high level and builds upon the techniques of proof that a student has learned in MAT 200 and MAT 305.

III. Student Assessment

This course is intended to be highly homework intensive. Weekly reading and writing assignments will constantly provide the instructor with information on the progress of individual students. At the same time students will receive weekly feedback on their work and their progress. A combination of quizzes and tests throughout the course will provide further valuable information both for the instructor and the individual students.

IV. Learning Activities

The specific choices of learning activities will depend upon the instructor, but it is expected that they will consist of some combination of lectures, group work, student presentations, individual homework, quizzes, tests and final exam.

of the basic notions of algebraic geometry by studying conics. The axioms of projective planes will be derived from the concrete examples and will not be the starting point of the course.

- B. Performance goals: At the completion of the course, students should demonstrate competence with the basic concepts and tools used in projective geometry. They should be able to use linear algebra calculations to solve intersections problems. They should be comfortable working with projective planes over the reals as well as over the complex numbers.

III. Student assessment

A. Assessment Plan: This course is intended to be highly homework intensive. Weekly reading and writing assignments will constantly provide the instructor with information on the progress of individual students. At the same time students will receive weekly feedback on their work and their progress. A combination of quizzes and tests throughout the course will provide further valuable information both for the instructor and the individual students. A syllabus should clearly describe the schedule for these assessment tools and how they will be used to calculate grades.

B. Rationale: Through the use of regular feedback from homework, quizzes, student presentations and examinations, students will be able to see and correct their misunderstandings and improve their performance.

C. Methods and criteria: We will use the assessment of homework, quizzes, student presentations, and examinations to evaluate student accomplishment of the course learning goals. These assessment tools are similar to the manner in which students will need to use their knowledge in the future and are an appropriate way to assess the accomplishment of course learning goals.

IV. Learning activities

A. Summary of learning activities: The specific choices of learning activities will depend upon the instructor, but it is expected that they will consist of some combination of lectures, group work, student presentations, individual homework, quizzes, tests and final exam.

B. Calendar or outline: A guide to the organization of the course, a schedule of assessment tools, and a plan for the coverage of topics should be provided to the students. Homework, quizzes, and examinations should be spaced at appropriate intervals throughout the semester. As a general rule, it is expected that each of the major topics will be given equal emphasis.

C. Rationale By giving students a multitude of ways to learn and do mathematics, the learning activities promote a deeper understanding of the subject and contribute to the learning goals of these programs. A regular spacing of assessment tools insures that students receive regular feedback on their work.