MATH 499
Syllabus
Spring, 2015

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Goals: This course is an introduction to algebraic geometry and elliptic curves. We will spend the first two weeks becoming familiar with the basic principles of algebraic geometry. After that, we will begin exploring elliptic curves. In the last three weeks or so of the term, you will present papers to the rest of the class. The overall goal is a “capstone experience,” a chance for you to bring your experience to bear on problems and ideas that are new to all of you in a way that will be new to most of you. I will rarely lecture; you will learn most of the material by reading, doing problems, and listening to each other. Ultimately, you will produce a textbook for the course complete with theorems, proofs, exercises, examples, figures, and exposition.

Assessment: Your grade is based on your effective participation, your presentations, your homework, your work on the text, and your journal, as well as possible quizzes. In addition, your final project will factor in to your grade.

I will grade presentations based on the correctness of your solution, the quality of your presentation, and your ability to answer questions about the problem, and I will share the rubric with you. In addition, I will distinguish exercises and proofs.

Your active participation is absolutely essential to the smooth running of this class. If you think a solution is erroneus, speak up. If you have a question, ask it. If you have a suggestion, make it. The only rule is that all such interjections must be made in a respectful manner. I will assess your participation daily.

In the last part of the course, you will present a paper (which I must first approve) to the rest of the class. This will take a great deal of preparation, so be sure to take it seriously and start early. You will also write a summary of this paper to hand in.

Active participation, Colloquia: 5%
Homework: 10%
Journal: 20%
Presentations, quizzes: 25%
Scribing, editing, writing the text: 25%
Individual project: 15%

Participation: I will expect you to be here every day since attendance is a prerequisite for participation. If you must miss, you should let me know in advance. I will evaluate everyone’s engagement each day. Doodling, dozing, texting, etc. do not qualify as suitable engagement. You are required to attend four colloquia this semester; this requirement appears in this component of the grade.

Homework: The missing portions of the text are homework. At each class meeting I will assign certain missing parts and exercises as homework. You will keep a Senior Seminar journal in which you will write your thoughts, ideas and problem solutions. All journal entries should be clearly dated and problem numbers clearly indicated in the margins. Your journal will be turned in and graded regularly throughout the semester. You should bring your journal to every class meeting. Sometimes the journal collection date will not be announced in advance. You should come to every class period with a 3 x 5 note card with your name at the top and a list of the assigned homework problems below. For each problem you will indicate one of the following four possible options.

- A circle around the problem number indicates you have completed the problem and have a solution you are willing to present at the board.
- A square around the problem number indicates you have made significant progress on a problem that you are willing to share with the class, but you acknowledge that your solution is not complete.

1 Thanks to Professor Johnson for much of this structure and language.
• A triangle around a problem number indicates that you have thought deeply about the problem, but not made significant progress; however, you’d be interested in facilitating a group discussion of the problem at the board by writing out the ideas of your classmates.

• The last option is to put no shape around the problem number. This option indicates that you have yet to give the problem much thought.

From among those students who put a circle or square about a particular problem number, one student will be chosen by me to present his or her solution/ideas to the rest of the class. If a particular problem is not circled or “squared” by anyone, then a student who “triangled” that problem will be selected to facilitate a discussion.

Your homework grade comes from your index card. Circled problems will earn 4 points, squared problems will earn 2 points, and triangled problems will earn 1 point. This component of your grade is somewhat on the honor system, although I will be comparing your cards to your journal entries, and I will choose presenters based on what the cards tell me.

Journal: Selected journal entries will be graded for correctness and completeness and should reflect that a significant amount of time outside of class has been spent thinking about the assigned problems. Proof problems will be graded out of 6 points and examples/exercise problems graded out of 3 points. For each problem circled on your 3 × 5 card a clearly written proof must be included in your journal in a form that could potentially be used as the basis of an in-class presentation. Journal entries must be labeled by problem number and the date(s) the work is written. If you could not complete a problem before the due date, you should take notes in your journal on the solution as presented in class and clearly indicate the date and name of the solution presenter. Taking notes from a presentation and not clearly indicating the name of the person who presented the solution will be considered plagiarism. I recommend using a different color for work entered after the due date.

Presentations and Quizzes: Presentations are graded on a 10 point scale, and presentation grades will be based on the correctness of the solution, the clarity of presentation, and the ability of the presenter to reply to questions from the class. I will provide a detailed presentation grading rubric. I will also be tracking the difficulty level of each problem you present. There are varying degrees of difficulty in the homework problems. All students must complete solutions for a large majority of the proofs assigned and present several proofs over the course of the semester. Not doing so will result in a lower homework and presentation grade.

I will give quizzes as necessary. The purpose of a quiz is to encourage you to review the text document often and to encourage you to understand all the problems, including those to which you did not initially find a solution.

Scribing, editing, and writing: Each week of class will have two designated scribes who will be responsible as a team for \LaTeXing the problems presented that week and any relevant class discussion. Scribes should take careful notes and type up the solution as it is presented in class. At the beginning of each \LaTeXed solution, the scribe will include the name of the student who presented the solution followed by the scribe’s name. The scribe responsibilities will rotate through all students in the class.

All students in the class are responsible for proofreading the entire \LaTeXed document. As we finish each chapter we will take some time to edit the draft document and produce a nearly final version of that material.

We will be using Share\LaTeX, an online collaborative \LaTeXeditor and compiler along the lines of a Google document – many people can edit it at once. I have shared a skeleton of the text with you; scribes will fill in the missing pieces.

Individual project: During the last few weeks of class, all students will pursue individual projects in elliptic curves based on their interests and previous mathematical course experiences. I will provide a list of potential project topics and students may choose from this list or seek other topics through a literature search. Each student selecting a project topic that is not on the list provided must submit a project proposal indicating the project objective and background sources. All project topics must be approved by me before work begins. While students work on their projects during the last few weeks of classes, I will meet with students individually to discuss their progress. During the last week of classes, each student will give a 30 minute formal presentation on their project topic and submit a written expository paper on their work that will be included in the course textbook. Half of the individual project grade will be based on your formal presentation and the other half on your written paper. Our section and Professor McNicholas’ section will combine for these presentations.
Honor Code: You may talk in general terms with each other about the homework, but the work you turn in is to be your own. No outside resources should be used unless it is a source that I specifically direct you to. All students must find their own phrasing and wording for the written homework. This is a writing class, and students need to practice actually writing the solutions to problems in their own words and symbols. Plagiarism is not expected and will not be tolerated. Copied homework will earn a grade of zero for all parties involved. I will spend no time attempting to figure out who copied from whom.

In accordance with Willamette University CLA catalog: “Plagiarism and cheating are offenses against the integrity of the courses in which they occur and against the College community as a whole... Ignorance of what constitutes plagiarism shall not be considered a valid defense.” For further information about the Willamette University academic honesty policy please refer to the CLA catalog.

Please note: Written responses to all questions must be in complete sentences. I expect correct usage of grammar, spelling, and punctuation at all times; your grade will reflect this! I also expect your work to be neatly written.

If you have special needs (e.g., for a documented disability), it is your responsibility to approach me at least a day in advance of the need for accommodation.

My door is usually open. The office hours above are the times I will definitely be in my office (or nearby), but you are welcome to come by at other times as well. I expect to be in frequent consultation with you outside of class.