

PMAT 503.01 Research Project

The project will consist of three parts: a project proposal, a written report on the research topic, and an in-class presentation on the research topic.

Research Topic

Your topic will be one of the following:

- counting the number of points on an elliptic curve over a finite field
- the elliptic curve discrete logarithm problem
- isogeny volcanos

Alternative topics will be considered — if you have a different project in mind, speak with the instructor.

Your projects should have an appropriate level of sophistication and significant mathematical content, although computer implementations as *part* of a project are fine. Your list of literature sources must include at least one research article, and projects must not be solely based on textbooks, web sites, survey articles, and the like. Also, beware of web sites, i.e. consider the level of knowledge and expertise of a web site's owner/creator before you use some of its content.

Proposal

Weight: 10%

Your proposal should be a fairly detailed outline of the report you will produce. It must include a summary of the research topic, an outline of the report, and a bibliography (the outline and bibliography need not be completely identical to the ones in the report, but they should match closely).

Your proposal must be typeset and must not exceed two pages in length (single-spaced, 12pt font). A hard copy must be submitted by the posted due date.

Proposals will be graded on:

- Motivation of topic (why it's interesting/important)
- Scope (required topics are covered, innovative aspects)
- Outline (organization and content)
- Literature survey (completeness, quality of sources)
- Choice of topic (relevance, innovation, level of difficulty)

The proposals will be graded in time for my comments and suggestions to be incorporated into your reports.

Report

Weight: 40%

You are to write a detailed report on the topic outlined in your proposal. Your report must be typeset (single-spaced, 12pt font) and should not exceed **8 pages**; this excludes the list of references. A hard copy must be submitted by the posted due date.

Part of the grade on your report will be based on overall presentation and quality of writing, so use a spell checker. Get someone else to read your report and comment on the grammar and readability before handing it in.

As always, plagiarism is a concern with written reports. Make sure to use your own words — do not copy any documents, web or otherwise, directly into your report. Using a few small quotes with proper attribution is fine, but copying large quantities of the documents is not. Cite all sources you've read on the topic, not only those that you directly quote.

Your report will be graded using the following criteria:

- Quality of writing (readability)
- Organization
- Motivation (what is the topic and why is it interesting)
- Content (all relevant aspects covered)
- Technical accuracy
- Depth and level of difficulty

Presentation

Marks: 10%

Student presentations will be scheduled during the last week of classes. They will most likely be 55 minutes in length, but this may vary depending on the number of students enrolled in the course.

You are encouraged but not required to use transparencies or a laptop with projector for your presentation. Please let me know in advance what equipment you will require.

Your grade on the presentation will be assessed based on the following criteria:

- Motivation (what is the topic and why it's interesting and important)
- Contents (the most important and relevant aspects are covered)
- Technical mastery (contents are correct, presenter is confident with the material)
- Conclusions (summary of results, open problems)
- Neatness of presentation (readability / legibility and organization of transparencies / computer screens / blackboard writing)