

# Math 498: Final Project

Spring 2024

## 1. OVERVIEW

Throughout this course, we have studied stochastic processes (in discrete and continuous time and also “discrete” and “continuous” space). For this final project, I would like you to select a topic which connects to some aspect of the course and write a report and give a 20-minute presentation on the topic. Your presentations will be done during the last week of classes and your final report will be due at the end of final’s week (you will have an opportunity to get feedback on a draft ahead of the due date).

## 2. PROJECT DESCRIPTION

As stated above, you should choose a topic related to the course material for your report. This topic should be distinct from what we’ve done in the course (though, it’s okay if it’s not distinct so as long as your report goes more deeply into the topic than we have). As we discussed in class, you have many many options!

On your selected topic, you will give a 20-minute in-class presentation and submit a report. Your presentations will be to me and the class and should give a good idea of what your topics is about and what the big ideas are (since the time is so short, you don’t need to worry about being too detailed). Of course, you should strive to be clear and informative (and exciting) – and you should feel free to be creative! The presentations will be done during the last week of classes; they’ll be scheduled a week ahead of time. The format/expectations of the report are discussed below.

The grading breakdown for this project is as follows: The presentation is worth 40% and the report is worth 60%.

## 3. TOPIC SELECTION AND OUTLINE (DUE FRIDAY, APRIL 12TH)

Please choose a topic and write a very brief outline of your report so that we can discuss and make sure you’re on the right track. **You’ve already done this!**

## 4. FORMAT OF REPORT

Your final report should be around 8 pages. Specifically, if  $P$  is the number of pages,  $6 \leq P \leq 10$  (including in-text figures, not including the cover page and bibliography). You must have a bibliography (more on this below).

This is an expository report. It should be well-written with clear prose, correct grammar and punctuation, with a minimal use of unnecessary symbols<sup>1</sup>, and VERY few typos. Beyond formal mathematical statements taken from other sources<sup>2</sup> – which I expect to be properly cited and credited – everything you write should be in your own words using your own voice.

---

<sup>1</sup>Do not use “ $\implies$ ”, “ $\exists$ ”, “ $\nexists$ ”, “ $\forall$ ”, “ $\dots$ ”

<sup>2</sup>This means definitions, theorems, corollaries, lemmas, propositions, etc.

Your reports should be typesetted in L<sup>A</sup>T<sub>E</sub>X and your final submission should be compiled (from L<sup>A</sup>T<sub>E</sub>X) as a PDF. To make things easier for you (and for me), I have created a template in Overleaf that you should use (available [here](#)). You can use any L<sup>A</sup>T<sub>E</sub>X editor/compiler of your choosing, e.g., Overleaf, Texmaker, TeXstudio, Emacs, etc.

## 5. GIVING CREDIT AND GOOD PRACTICE OF ACADEMIC INTEGRITY

I strongly encourage you to look at several sources as you write your report. Beyond any direct quotations from your sources – which must be appropriately cited – what you write down and the way that you present the material must be your own. It is not acceptable to simply rewrite the material from a source. For example, if you decide to include the proof of a result in your exposition of the material, the proof must be presented clearly in your own words, not simply a facsimile of your source. Still, if you have used a source for ideas to construct a proof of something, the author of that source should be credited.

Your project should follow all guidelines concerning academic integrity listed on our syllabus for the course. I also encourage you all to see Colby’s web-site on academic integrity ([here](#)) which contains many useful resources. Also, if at any point you would like help on how to appropriately give credit and cite a source, please email me and I’ll happily help!

## 6. THE BIG DETAILS (DUE DATE, OPPORTUNITY FOR FEEDBACK, FAQ)

- (1) Your topic and outline is due, via email, on April 12th (**You’ve already done this!**).
- (2) The report is due on the penultimate day of the final examination period (May 19th), by 11:59PM in your respective time zone.
- (3) You report should be in PDF form (compiled from L<sup>A</sup>T<sub>E</sub>X) and emailed to me.
- (4) If it is of interest to you, I am happy to read a pre-final draft of your report and give you some feedback. To make use of this opportunity for feedback, you will need to send me your draft on or before May 10th. This draft should be very close to a final draft, include all appropriate citations, and be polished. I will do my best to get this draft back to you within a 48-hour period.
- (5) If you want guidance for the project, about anything, short of submitting a pre-final draft for feedback, please email me. I’m happy to discuss and help you via email and I’m also available to meet with you via Zoom.
- (6) I have created a useful template for your report. It is available in Overleaf at the following web-address:

<https://www.overleaf.com/read/btqwdzhgmwbtb>

To build your report from this template, you should open a new project for yourself and paste the contents of this template into your report. Also, put the associated .eps file within your project – which of course should be replaced by any image files you’d like to include.

- (7) The template above produces many pages, including a title page and a table of contents. As stated above, the body of your report should be around 6

pages including in-text images, equations but not including the title page, table of contents or bibliography.

**Some Frequently Asked Questions:**

- (1) Is  $\text{\LaTeX}$  necessary? Yes.
- (2) Format of citations, MLA or APA? When including sources in your bibliography, it doesn't matter to me which format you use (MLA, APA, or something else). It is however essential that you include the name of the author and enough information (title, publishing company, edition, year, web-site) that I can find the source myself. If you have any questions on what is "enough", please contact me or your librarian.
- (3) Are formal statements expected? Not necessarily. Precision is expected and the necessary definitions should all be given precisely. Beyond that, things are up to you.
- (4) Are proofs expected? No. This is an expository report. You should include all details that you feel will make your presentation clear and informative.
- (5) Are figures expected? No, but figures are a really nice way to illustrate things, so please don't go out of your way to avoid figures.
- (6) Other questions? Please email me.