

Research projects

Note that the research projects count for 30% of your total grade. Here, everything will sum up to 100% and then 30% of that will be your research project grade.

1. Project Plan: Due April 9 (submit pdf through catcourses) (15%)
 - (a) Meet with your group initially to start discussing a topic
 - (b) You can meet with me to discuss the project plan and help further ideas - come prepared to this meeting with some topics you would be interested in
 - (c) Write a very thorough draft including the Introduction and Methods part of your report.
2. Conduct the research and analysis: Due April 23 (submit pdf through catcourses) (15%)
 - (a) Read appropriate materials to do the work
 - (b) Conduct the work - make sure to document results to use in your report and presentation
 - (c) Modifications may need to be made to repeat the work (plan time for this)
 - (d) Discuss what analysis will be done on the results and presented
 - (e) Do the analysis
 - (f) Modify the methods part of the report based on what was actually done in your report draft
 - (g) Write up the results and analysis section of the report
 - (h) Turn in a draft with the Introduction, Hypothesis, Methods, and Results and Analysis. Make modifications to previous parts based on feedback given.
3. Written Reports: Due May 5 (submit pdf and m-files through catcourses) (40%)
 - (a) Introduction (at least 3-4 paragraphs) **15 pts**
 - i. What is being studied? State the problem.
 - ii. Why is this important and/or relevant? Make sure to motivate why you chose this problem
 - iii. Include some background of similar problems, applications of your problem, if your problem has been studied before.
 - iv. Explain what you think will happen in this study and why? What do you expect to learn?
 - (b) Methods **20 pts**
 - i. Describe the methods that will be used to study this problem.
 - ii. Explain exactly what you are doing and what results you aim to collect.
 - (c) Results and Analysis **35 pts**
 - i. Present the results collected.
 - ii. Show any analysis conducted these results and explain what it means.
 - (d) Discussion/Conclusions (at least 3-4 paragraphs) **20 pts**

- i. Summarize in a few sentences your problems and the results.
 - ii. Did things turn out the way you expected? Do your results make sense? Refer to the results and analysis to provide evidence of this.
 - iii. Compare your results to other results of similar problems.
 - iv. What did you learn from this project?
- (e) References **10 pts**
 - i. Make sure to cite all references including digital references. Make sure to cite anything you get information from and to rewrite things in your own words.
- 4. Presentation: May 7 (30%)
 - (a) Use your report to put together a presentation (powerpoint or beamer in L^AT_EX).
 - (b) Prepare (20 minutes) and conduct practice presentations.
 - (c) Make modifications on the presentation based on feedback from practices.
 - (d) Give the final presentation.

Note: Since this year, this is a joint project for Math 222 and Math 232, it is mandatory that your project has a numerical component. This means that you need to chose a numerical method to discretize the PDE involved in your project.