# AMAT 502 – Modern Computing for Mathematicians

Class time: T/Th 11:45 - 1:05 Room: SL G03

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**Office Hours:** 10:00-11:30 T/Th or by email appointment

**Course Description:**

Introduction to

1. basic principles of computer algebra systems
2. contemporary mathematical typesetting, and
3. mathematically literate techniques for disseminating mathematical content in both print and HTML-with-MathML forms from a single source.

Several computer algebra systems will be examined with an eye toward understanding how to handle various mathematical objects and how to write procedures for tasks that are not handled natively. Written assignments will specify mathematical tasks and presentation standards.

Prerequisite: Familiarity with undergraduate mathematics and some ability with computer code.

**Website:**

The blackboard website, http://blackboard.albany.edu, has announcements about the course and any

necessary files. Homework will also be announced and saved on this website.

**Textbook:**

None

**Grading:**

* Homework 60%: There will be approximately bi-weekly homework assignments based on content covered in class.
* Project 40%: The main component of this course is a project applying the tools you have learned in the class. You can tailor this project to be something based on your mathematical interests. For instance, create beamer slides and present a talk you have been working on (e.g. dissertation defense), get a data set and use numpy and pandas to do statistical analysis, etc.

**Potential Topics Covered:**

This is by no means a complete list of potential topics, and we will likely not get to everything. I am happy to modify the syllabus based on student interest. If you have something you desperately want to see covered, please send me an email.

* LaTeX, the mathematical typesetting system
* Beamer, a system for generating slides for talks
* Git and Bitbucket, a version control system
* Inkscape, for drawing figures
* Python & Sagemath
  + Numpy
  + Scipy
  + Matplotlib
  + Pandas
  + Graphlab
* R
* Setting up a basic website with HTML and CSS