

Syllabus for Math 492E, Computer Programming for Mathematicians

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Course Description: This course aims to teach the art of computer programming in a way that is useful and applicable for mathematicians. Most of the course will be based on the C programming language. However, the primary focus of the course will be on tools, techniques, and good practices more than about the C language.

Textbook: During the beginning of the course, I will be more-or-less working from “The C Programming Language” by Kernighan and Ritchie. However, much of the material will come from the lectures or in the form of selected online resources. If you want to purchase “The C Programming Language”, it does make a good reference.

Grading: This course will be “graded” in the sense that I will be required to turn in grades at the end of the summer. Grading will be done entirely based on participation in the course and making an effort to learn the material. No one should be concerned about failing.

Exercises: Some sections may have a few small exercises at the end. These will be short programs designed to provide practice with a particular piece of material.

Projects: Throughout the course, I will provide projects to help re-enforce the material being covered. These projects will not be graded. However, I will look over them upon request and provide feedback on your code. The projects will be optional in the sense that they can easily be subsumed by a research project assuming that it corresponds reasonably well to the material being covered in the course (see below).

Research Code: I recognize that many of the people interested in this course come from applied mathematics and have a direct project in mind. I am more than willing to help with your research code and allow you to use that instead of the projects. In many ways having your own project is better than working on one that I assign.

Programming Style: Throughout the course, I will enforce good programming style. This includes indentation, descriptive variable names, good use of spaces, comments, and good code organization. I am more than willing to look at and help you with your code. However, I will not help debug a badly formatted and uncommented mess. This is comparable to turning in your messy scratch work for a homework assignment instead of re-writing and/or typing it.

Be warned that I will be pedantic about this. That said, well formatted/organized code is not only easier to read but also more likely to be correct than badly formatted/organized code. Therefore, my first suggestion for fixing a piece of code may be to simply rewrite it in a better organized manner.

Disclaimer: I have never taught this course or one like it before. Therefore everything described in this syllabus is tentative at best. I reserve the right to, at any time, add, remove, re-order the material being covered as needed. I announce any topic changes and will try to make them public via the course website.