

Course Description

Physics 7682 / CIS 6229: Computational Methods for Nonlinear Systems
Fall 2008

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Structure. This course is run as a self-paced computer lab. There will be short lectures introducing various scientific topics, but for the most part the course consists of implementing and analyzing scientific computations based on exercises, published papers, and documented code fragments. It is **not** expected that students complete **every** module by the end of the semester, nor should that be your goal. Rather, it is useful to work on a set of modules that span a range of scientific and computational topics, to get a sense of the breadth of techniques and applications. Opportunities also exist for motivated students to implement computations described in other papers or in research-related projects.

Prerequisites. No formal prerequisites exist. A wide variety of computational backgrounds among students is anticipated, with some students having considerable experience in computational science research and others having little or no previous exposure to programming or the topics in this course. The course is largely autonomous, self-paced, and broken into modular units. In each module, everyone should complete the basic introductory sections, and most modules include opportunities for more advanced and/or interested students to pursue problems in more detail.

Time commitment. The course is structured to avoid substantial efforts out of normal class hours, so regular attendance and participation during class time is important. Because of the flexible and self-paced nature of the course, however, time missed due to occasional conflicts can be easily made up outside normal class hours.

Grading. It is recommended that you take this course pass-fail, unless your program demands that you take it for a grade to fulfill a requirement. If you take it for a grade, we will need to negotiate a scheme to evaluate your performance (typically either as a brief oral examination at the end of the semester, and/or work on an additional small project of the student's interest). Otherwise, attending regularly and remaining productively engaged throughout the semester are the most important factors. Working together in groups is encouraged and can be useful in learning the material, with the caveat that all group members should take turns in writing and running code.