MAT 331: Mathematical Problem Solving with Computers

Stony Brook, Fall 2008

General Information: This course serves as an introduction to computing for the math student. After a general introduction to the use of the computers, we will turn to more mathematical problems. The emphasis of this course is on the problem solving portion of the title: we will take a series of problems and try to find solutions (or approximate solutions), keeping in mind that we have access to computers. We will discuss the problems and development of necessary mathematics, and then we will turn to the computers to explore and work out the solutions.

Computers: We will use the math computer lab in S-235 of the math tower; this lab contains 30 Apple iMac computers running Ubuntu Linux. While we will be the Linux machines in class, much of the work can be done on other systems. We will rely heavily on Maple (a program that can do algebra, calculus, graphics, etc.), although if other tools are better suited to the task, we may make use of them. No previous experience with computers is needed. Maple is available for most platforms (Windows, Macintosh, Linux, . . .); Stony Brook students can buy a copy of Maple at the Seawolves Market Place for five dollars. Maple can also be used all Stony Brook Sinc Sites.

In addition, you can access the mathlab computers from off campus via the internet.

Text: The text for this course is a set of notes currently being written by Professors Sutherland and Simanca. These are available on the class web page; they may be revised somewhat as the semester progresses. You might find it useful to obtain a book about basic Linux commands, and/or about Maple. Most of what you need will be covered in class, but it is often useful to have a reference at hand.

Projects and Exercises: There will be a number of exercises assigned, as well as three or four projects. An exercise is a homework assignment, that you should be able to complete in at most a couple of hours. Each exercise counts for the same amount of points, whether they are easy or difficult, and there will be between two and four weekly exercises. A project is more like a term paper you will be expected to devote a significant amount of time to doing it, as well as taking care with the presentation.

All exercises and projects will be posted in the course web page:

http://www.math.sunysb.edu/ moira/mat331fa08/index.html

Working together on the projects is encouraged, although, *each student will be responsible for turning in a write-up of the problem and solution.* This should contain a detailed description of the problem or topic, what means were used in solve it, and the solution. These write-ups should be produced by each student individually, and should be detailed enough so that someone who has not taken the class can read and understand them, and will believe the solution is correct. These write-ups are often acceptable for the mathematics writing requirement.

Grading: Your grade will be based on the projects, the exercises, and in-class participation. In total, the exercises count as a project. There will be no exams. *Both the expository and computational aspects of the project write-ups will be graded and count equally.*

Instructor: Prof. Moira Chas at 4-103 Math Tower phone: 632-8266 email: moira@math.sunysb.edu (email is the most efficient way of communication). Office hours: Tu-Th from 12:45 to 2:15pm,

http://www.math.sunysb.edu/∼moira/

Disability Support f you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or http://studentaffairs.stonybrook.edu/dss/. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.sunysb.edu/ehs/fire/disabilities.shtml

Academic Integrity: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another persons work as your own is always wrong. Faculty are required to report any suspected instance of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, and/or inhibits students ability to learn.