CS/MATH 3414: Numerical Methods

Computational methods for numerical solution of non-linear equations, differential equations, approximations, iterations, methods of least squares, and other topics. Partially duplicates MATH 4554. Pre: MATH 2214, MATH 2224 and CS 1044 or equivalent. (3H,3C). I, II, III.

Meeting Times	MWF 11:15am-12:05pm, McBryde 216
Instructor	Dr. Naren Ramakrishnan, 1-8451, McBryde 629
	naren@cs.vt.edu, http://www.cs.vt.edu/∼ramakris
Office Hours	Mondays 1-3pm, Tuesdays 10am-12pm.
Teaching Assistant	Yuxin Chen, McBryde 133
	yuchen@csgrad.cs.vt.edu
Office Hours	Wednesdays 9-11am, Thursdays 10am-12pm.
Listserv	CS3414_16462@listserv.vt.edu
	(yes, the name is rather long winded.)
Course Web Page	http://courses.cs.vt.edu/∼cs3414
	(make sure you click on the right section!)

If you are unable to make the above times and need to meet with us, you can setup an alternative time via email. If you need adaptations or accommodations because of a disability (learning disability, attention deficit disorder, psychological, or physical), if you have emergency medical information to share with the instructor, or if you need special arrangements in case the building must be evacuated, please meet with the instructor ASAP.

Course Goals: The aim of this course is to give you an appreciation of how to do (numerical) mathematics by computer. We will look at the basic tenets of numerical computing, the nature of errors introduced, and how to design algorithms for important classes of problems. Numerical methods form the underpinnings of mathematical and scientific software and their understanding is critical to computer science.

Pre-requisites: The pre-requisites MATH 2214, MATH 2224, and CS 1044 or equivalent will be strictly enforced. No exceptions; first-day attendance is mandatory. At the end of the first class, turn in the signed pre-requisite form.

Evaluation: There will be 10 homeworks, which will involve a mix of mathematical problems and programming assignments. There will be two exams, besides the final. Detailed breakdown: homeworks (25%), exam 1 (25%), exam 2 (25%), and final (25%). No late submissions will be accepted, except under 'valid' circumstances (contact the instructor to see what applies here). If you have an exam or homework that you feel has been graded incorrectly, please contact us, and we can discuss a re-grading if appropriate.

Keeping in Touch: Please use the listserv actively for discussions and exchanging ideas. Since it is created automatically by a central university system, any student registered in CS/MATH 3414 (this section) will be added to the mailing list. If you do not receive a test mail from the instructor by the end of the first week of classes, ensure that your email address is properly recorded in the university system.

Workload: The course moves at a very fast pace! You are expected to readup on material after every class and complete the homeworks diligently. I can make the course interesting but you are expected to have a willingness to learn and to put in the required effort.

Electronic Accounts and Programming: You are expected to have accounts on the undergraduate lab network in McBryde Hall or some other equivalent facility. Familiarity with high-level programming is expected, in an operating system of your choice.

Book: The following is the required textbook for the course.

CK Ward Cheney and David Kincaid, Numerical Methods and Computing, Fourth Edition, Brooks/Cole Publishing Company, 1999. The authors maintain a web page for the book at http://rene.ma.utexas.edu/CNA/NMC4/index.html. This contains useful information such as an errata, and free software for implementing the algorithms in the book.

Honor Code: The Virginia Tech honor code applies. The work you turn in must be your own. Please read the CS department's 'policy on koofers, old programs, cheating, and computer use' which is applicable here. It is available at http://www.cs.vt.edu/academics/ugrad/Handbook/koof.html.