

## Math 481A - Summer 2008

- Instructor: Bruce E Shapiro  
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626-395-8161
- Class Time: M,T,W,Th 4:00-5:50PM
- Class Number: 10527
- Location: JR-202 (Jerome Richfield Hall)
- Class Web Page: <http://beshapiro.com/math481A/>  
Note: the server is case-sensitive!
- Catalog Description: Prerequisites: MATH 262; COMP 106/L or 110/L. Techniques of applied mathematics, solution of equations, interpolation, numerical integration, numerical solution of differential equations.
- Learning Objectives: Basic concepts and theoretical foundations of Numerical Analysis; the basic techniques of numerical programming; the methods, capabilities, and limitations of solving mathematical problems on a computer.
- Topics Covered: Number representation in computers; sources of error; floating point arithmetic; root-finding (Bisection, Newton's Method, secant method, fixed point iteration); linear systems (Gaussian elimination); Interpolation (Lagrange, Newton, Hermite, Splines, Bezier Curves); Least squares approximation; Numerical differentiation and integration; solution of initial value problems in ordinary differential equations.
- Grading: 50 %: Homework  
25 %: Midterm Exam (in class, Monday 16 June 2008)  
25 %: Final Exam (in class, Tuesday 8 July 2008)
- Homework: There is a substantial amount of homework in this class and it counts for half your grade. If you don't do the homework you will fail the class.
- Homework assignments and due dates will be announced in class and are subject to change.
- There is a late homework penalty of 10% per day late which will be waived or reduced if there are extenuating circumstances.
- While I encourage people to work together and discuss the homework, I also expect that each student will turn in their own work. There will be a penalty if different students turn in what are basically copies of the same work.

- Programming: There are no “computer projects” in this class. However, there is a lot of homework and some if it is better done on the computer.
- Nearly all homework problems can be done either on the computer or by hand. Many of them will be **significantly easier** if you use the computer. Whenever you begin a homework problem your first thought should be: “Can I find an easier way to do this using the computer?”
- You may do your assignments using any computer language. All of the algorithms in the textbook are already implemented in a number of languages on the program disk and on the textbook website (Mathematica, MatLab, Maple, Java, Fortran, C, etc.) and you are encouraged to use these programs for your assignments.
- Mathematica: Using mathematica is not required in the summer session because of the lack of campus resources. If you already know mathematica or want to learn it, I have implemented most of the algorithms that we will study in Mathematica and posted them on the class web site. You are free to use these in your homework.
- Text and Notes: A textbook is not really necessary but I’ve made one available for students who are interested.
- There are over 200 pages of lecture notes available that you can download from the class web site, and all of the homework problems will be posted as well.
- We will actually cover the first five chapters of *Numerical Analysis* by Richard Burden and J. Douglas Faires very closely. The bookstore has ordered copies of the 8th edition for \$189 (The publisher recently raised the price to \$184.95 from \$138.95.) I suggest you **do not buy this book** unless you are loaded.
- I prefer the 7th edition, which which you can find for under \$25 at six or seven online resellers. There is a link on the webpage to help you search.
- Student Conduct: Students are expected to conduct themselves in accord with university policies on Student Conduct and Academic Dishonesty. Violation of this code could be punishable by a failing grade in the class or removal from the university, as determined by Dean of Students.
- The student conduct code is available on the internet at the web page <http://www.csun.edu/a&r/soc/studentconduct.h>
- It is also published in the CUSN catalog, Appendix C, which you can obtain as a free download at <http://www.csun.edu/catalog/>