Math 600, Topics in Numerical Analysis

Summer 2003 (May 21 - July 8)

Instructor:	Dr.W.Proskurowski (proskuro@math.usc.edu)
Lecture:	MWF 10-12, DRB 140
Office:	DRB 220, Hours: MWF 2-3

This is a course devoted to computationally efficient numerical schemes for solving applied problems of interest.

Course Outline

(tentative, it will be adjusted according to students' research interests)

1. Review of basic concepts in Linear Algebra
2. Computation in Matlab using the sparse mode for large problems
3. Preconditioned conjugate gradient iterations
4. Basic difference and finite element schemes for time dependent PDEs.
5. Solving 2-D parabolic PDEs: ADI and fractional steps methods.

Suggested reading:

'Numerical Linear Algebra' by L.N.Trefethen and D.Bau, SIAM, 1997.

'Numerical Solutions of PDEs' by G.D.Smith, Oxford, 3rd ed., 1985.

'Num. Lin. Algebra and Appl.' by B.N.Datta, Brooks/Cole, 1994.

There will be individualized small projects chosen by the students who will present (seminar style) the reports at the end of the course, and no exam.