Some Suggested Project Topics:

1. Use a finite element method to solve a problem of interest to you. You may write your own finite element code or try a package, such as PLTMG. (Available from `http://www.netlib.org`. Search for 'pltmg'.) Report on the physical origin of the problem, the methods that you use to solve it, and the results that you obtain. Include whatever comments you can on the accuracy and efficiency of your solution method.

2. Report on methods for automatic mesh generation or adaptive mesh refinement.

3. Report on multigrid methods. Possible references: *A Multigrid Tutorial* by William Briggs (good introduction, not too technical); ch. 10 of *Iterative Solution of Large Sparse Systems of Equations* by Wolfgang Hackbusch (good convergence analysis but hard to read).

4. Report on domain decomposition methods. Possible reference: *Domain Decomposition: Parallel Multilevel Methods for Elliptic Partial Differential Equations*, by B. Smith, P. Bjorstad, and W. Gropp.

5. Report on the p-version of the finite element method.