School of Mathematics

Course 161 — Introduction to Numerical Computation 1998-99
(JF Mathematics,
JF Two-subject Moderatorship,
JF Theoretical Physics,
SF Two-subject Moderatorship,
SF Natural Sciences.)

Lecturer: Dr. James C. Sexton

Requirements/prerequisites: None

Duration: 24 weeks

Number of lectures per week: 3

Assessment: Regular programming assignments, counts 25%

End-of-year Examination: One 3-hour examination, counts 75%

Description:

Computer Architecture: memory/processor model, memory organization, data formats, binary, octal, decimal, and hexadecimal arithmetic, processor organization, simple assembly language, preipherals.

The C Compiler: declarations, input/output, assignment statements, precedence, if, while, and for statements, functions, argument passing in functions, pointers, arrays, system libraries, mathematical function libraries, memory allocation.

Numerical Methods: Root Finding through Bracketing and Bisection, Newton Raphson method, Golden Section search in one dimension to find maxima and minima, Numerical solution of ordinary differential equations (initial value problems), Numerical Integration, Random Numbers.

Fortran.

Textbooks:
The C Programming Language Kernighan and Ritchie (Prentice Hall)
Numerical Recipes in C Press, Teukolsky, Flannery, and Vetterling (Cambridge University Press)

June 10, 1998