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CONTENT AND FORMAT CRITERIA FOR NEW COURSE PROPOSALS AND MAJOR COURSE REVISIONS

New course proposals and major course revisions must be submitted in the form described below. This form applies to the submission of a single course or to a series of new courses tied to a new or revised graduate program proposal. if rhe'course(s) is part of a new or revised graduate program proposal, the

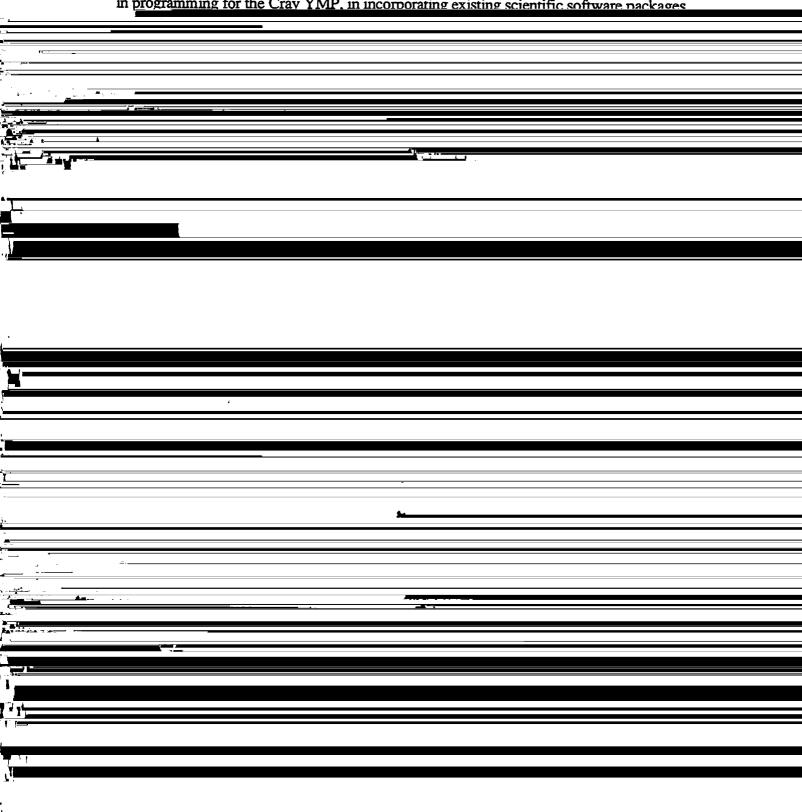
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	Department: Mathematics

Person to Contact for Further Information: Dr. H. E. Donley

Course Descriptions

MA 451 Numerical Methods for Supercomputers

3c-0l-3sh Prerequisites: MA 121 and MA 122, or MA 123 or MA 127, MA 171, CO 250
Supercomputers make use of special computer architectures— vector and parallel processors—in order to achieve the fastest processing speed currently available. Students will be introduced to these features and will learn how numerical algorithms can be constructed to exploit supercomputers' capabilities. Students will gain practical experience in programming for the Cray YMP, in incorporating existing scientific software packages



Course Syllabus

Course Objectives: Students will

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Required Textbook(s):

Golub, G., and J. Ortega, Scientific Computing: an introduction with parallel programming, Academic Press, 1993.

Resource Requirements:

Thang are no marial materials required of the student

Bibliography:

Levesque, John M., and Joel Williamson, A Guidebook to Fortran on Supercomputers, Academic Press, 1989.

An introduction to supercomputer architectures (requires a basic knowledge of architecture terms), writing Fortran code for vector processors.

Brawer, Steven, Introduction to Parallel Programming, Academic Press, 1989.

Basic description of parallel architectures, principles for parallel programming with examples given in Fortran, some applications, parallel C under Unix.

Krishnamurthy, E. V., Parallel Processing: Principles and Practice, Addison-Wesley Publishing Co., 1989.

Somewhat advanced. Theoretical introduction to parallel processes (requires some knowledge of computer architecture and programming languages), principles of parallel programming, applications to databases.

Akl, Selim G., The Design and Analysis of Parallel Algorithms, Prentice-Hall, 1989.

Requires some knowledge of the analysis of algorithms. Types of parallel computers, many applications—searching, sorting, numerical methods, operations research.

Bertsekas, Dimitri P., and John N. Tsitsiklis, Parallel and Distributed Computation: Numerical Methods, Prentice-Hall, 1989.

Somewhat advanced. Introduction to parallel processes; synchronous and asynchronous algorithms for numerical methods and operations research.

K. A. Galligan, Heath, Ng, Ortega, Peyton, Plemmons, Romine, Sameh, and Voigt, Parallel Algorithms for Matrix Computations, SIAM, 1990.

Advanced. Parallel algorithms for dense linear systems and sparse linear systems, extensive

Course Analysis Questionnaire

	Section A: Details of	of the course		
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