

## **Selected Topics in Applied Mathematics**

Applied and Comp Math 990

Section: G100

Term: 2012 Spring

Instructor: Steve Ruuth (sruuth@math.sfu.ca)

Discussion Topics: The purpose of this course is to give an introduction to the finite element method (FEM) as a general technique for the numerical solution of partial differential equations in science and engineering. The focus is on computational and theoretical properties of the method, but we will also consider applications from various areas as time permits. The mathematics will be kept relatively simple while still presenting significant results and considering non-trivial problems of practical interest. Topics include an introduction to FEM for elliptic problems; abstract formulation; finite element spaces; approximation theory; direct and iterative solution of finite element equations; FEM for parabolic and hyperbolic equations; and selections from special topics such as adaptivity, mixed methods, curved elements, FEM on curved surfaces and nonlinear problems.

Grading: The course grade will be based on homework assignments and a term project.

Required Texts: Numerical Solution of Partial Differential Equations by the Finite Element Method by Claes Johnson.

Recommended Texts:

Materials/Supplies:

Prerequisite/Corequisite: The prerequisites are some knowledge in partial differential equations and numerical methods.

Notes: Note: Outline is subject to revision as indicated in the first lecture

THE INSTRUCTOR RESERVES

THE RIGHT TO CHANGE ANY OF THE ABOVE INFORMATION.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester.

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