School of Mathematics

Course 413 1998-99

(Optional JS & SS Mathematics, SS Two-subject Moderatorship)

Lecturer: Professor L.J. Crane

Requirements/prerequisites: 131, 231

Duration: 21 weeks

Number of lectures per week: 3

Assessment:

End-of-year Examination: One 3-hour examination

Description: Partial Differential Equations

Expansion of functions in series of eigenfunctions. Variational methods to finding approximations to eigenvalues.

Method of separation of variables applied to problems involving the Laplace equation, the wave equation and the heat-conduction equation.

Finite transforms applied to boundary value problems.

Infinite Fourier transform; Laplace Transform and Mellin Transform applied to boundary value problems, (emphasis on contour integral methods). Application of Laplace Transform to derivation of Laplace integral solutions of ordinary differential equations.

Classification of p.d.e.'s. Theory of characteristics applied to wave problems.

Application of dimensional analysis to p.d.e's.

Asymptotic expansions of integrals occurring in transform methods.

June 10, 1998