Elective subject mathematics

Partial Differential Equations
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In this basic course we give an introduction to the main topics, methods and applications of partial differential equations. Using classical methods of analysis we discuss problems concerning the existence and the uniqueness of solutions, different methods of representing solutions, and the properties of the solutions.

In the practical numerous examples will be presented in detail by the lecturer. This will give the opportunity to get practice in handling the representations and to demonstrate the propositions of the theorems presented.

Content

Partial differential equations of second order
> Basic concepts, initial value problems for hyperbolic and parabolic differential equations, boundary value problems for elliptic equations.

Conformal mappings and Green's function

Linear partial differential equations and Fourier series

Method of seperation of variables
> The heat equation, the wave equation, the Laplace equation and Poisson's equation.

Nonlinear problems

Applications

A lecture note is available

References

S. J. Farlow *Partial Differential Equations*, Wiley

P. R. Garabedian *Partial Differential Equations*, Wiley

K. E. Gustafson *Partial Differential Equations*, Wiley

T. Myint–U *Partial Differential Equations of Mathematical Physics*, North Holland