

Functional analysis with applications in mathematical physics.
Professor Sergey Sergeev

1D case for the second-order stationary equations. Weak solution and Sobolev spaces. Variational (Dirichlet) principle, energetic spaces, minimization problem. Applications for the finite element methods, Ritz and Galerkin methods for approximation for the solution. Boundary conditions. Applications for the heat, wave and Schrodinger equations. Similar theorems and cases for the 2D case (in short).

Literature

1. H. Brezis. Functional Analysis, Sobolev spaces and PDE.
2. Zeidler. Applied Functional Analysis. Application to Mathematical Physics.