Numerical Methods for Partial Differential Equations

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Content

Elliptic Problems

Approximation by means of the Galerkin method
Finite elements and interpolation error
Error estimates

Parabolic Problems

Convergence analysis for the space semi-discretization
Analysis of stability and convergence of the theta-method for time advancing scheme

Optional topics

Mesh adaptivity and a posteriori error estimates

Mixed variational formulation

Eigenvalue problems

Introduction to the approximation of hyperbolic problems

References

A. Quarteroni, **Numerical Models for Differential Problems**, Springer 2013.

S. Larson, V. Thomée, **Partial differential equations with numerical methods**, *Texts in applied mathematics*, Springer 2005.

A. Quarteroni, A. Valli, **Numerical approximation of partial differential equations**, Springer 1994.

D. Boffi, F. Brezzi, M. Fortin, **Mixed Finite Element Methods and Applications**, Springer 2013.