MA 615 Numerical PDEs

Outline

- Part I PDEs and their Equivalent Formulations
  (1) PDEs: elliptic eqn. & hyperbolic conservation laws
  (2) weak formulation
  (3) minimization formulations (energy and least squares)
- Part II Classes of Approximating Functions
  (1) polynomials
  (2) piecewise polynomials: finite elements, neural networks,
  (3) ...
- Part III Numerical Methods
  (1) discretization methods

- finite element methods
- least-squares neural network method

(2) algebraic solvers

- classic iterative linear solvers
- standard iterative nonlinear solvers

(3) self-adaptive numerical methods