Topics in Applied Mathematics

Spring 2012, ACMS 80770

Instructor: Dr. Yongtao Zhang (yzhang10@nd.edu)

Class time and location: MWF 10:40-11:30am, DBRT 232

Office location: HAYE 242

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Office hours: Thursday 2:00pm – 4:00pm, or by appointment.

Textbook: None

Pre-requisite: graduate-level Numerical Analysis, undergraduate-level partial differential equations

Course description: The course will emphasize several high order accurate numerical methods for solving partial differential equations (PDEs). Algorithm design, analysis and implementation will be discussed. Topics include weighted essentially non-oscillatory (WENO) finite difference and finite volume methods for hyperbolic conservation laws and Hamilton-Jacobi equations, discontinuous Galerkin (DG) finite element methods for convection-dominated equations and PDEs containing higher-order spatial derivatives, and numerical methods for advection-reaction-diffusion equations. Applications of these numerical methods to physical and biological problems will be discussed.

References:


