

## CAAM 452 · Numerical solution of partial differential equations

Spring 2021 · Rice University

Lectures: Online, 1:30-2:50pm Tuesday and Thursday.

Objectives: This course covers various numerical methods for solving partial differential equations, with focus on theoretical aspects and practical implementation (using the Julia programming language) of finite difference methods and finite element methods for elliptic, parabolic, and hyperbolic problems.

Time permitting, aspects of other numerical methods (e.g., finite volumes, discontinuous Galerkin) may also be covered.

Instructors: Jesse Chan (jesse.chan at rice.edu), Duncan Hall 3023, 713-348-6113

Office Hours: Tuesdays 2:50-4pm or by appointment.

Prerequisites: Calculus, linear algebra, basic programming experience

Grading: 100% homework. Extra credit may be given for participation in discussion forums.

Late Policy: Homeworks may be turned in late with advance instructor permission.

Texts: *Finite Difference Methods for Ordinary and Partial Differential Equations: Steady-State and Time-Dependent Problems* by Randall J. LeVeque.

*Understanding and Implementing the Finite Element Method* by Mark S. Gockenbach.

Supplementary: *An analysis of the finite element method* by Gilbert Strang and George Fix  
*Finite Volume Methods for Hyperbolic Problems* by Randall J. LeVeque.

*Any student with a disability requiring accommodation in this course is encouraged to contact the instructor during the first week of class, and also to contact Disability Support Services in the Ley Student Center.*