NUMERICAL ANALYSIS OF PARTIAL DIFFERENTIAL EQUATIONS, EPISODE 1: THE FORCE OF THE PDES AWAKENS

Partial Differential Equations is the mathematical language that condenses multi-decades effort of accumulated physical knowledge of our galaxy. Equations of conservation of mass, momentum and energy led to the Euler and Navier-Stokes equations, describing pretty much all what is known about about fluid mechanics. Maxwell's equations explain the propagation of light as well as radio waves. And Schrödinger's equation describe the dynamics of spinless quantum particles. However, without numerical methods in order to solve them, it is not possible to unleash their predictive force. Still today, in the age of information science, technological progress is fundamentally limited by our knowledge of physical systems and our ability to predict their behavior. Join the group of rebels that intend to advance the state of the art of Numerical Analysis of PDEs.

A graduate level course in Numerical Analysis of PDEs. Coming to TTU classrooms this Spring 2024. Directed by Ignacio Tomas, based on the non-fictional books of:

J-L. Guermond and A. Ern, Theory and Practice of Finite Elements, 2004.
A. Ern and D. DiPietro, Mathematical Aspects of Discontinuous Galerkin Methods, 2011.
A. Salgado and S. Wise, Classical Numerical Analysis: A Comprehensive Course, 2023.
S. Larrson and V. Thomee, Partial Differential Equations with Numerical Methods, 2005.
E. Godlewski and P-A. Raviart, Numerical Approximation of Hyperbolic Systems of Conservation Laws, 1996.
Lawrence C. Evans, Partial Differential Equations, 2022.

Disclaimer: this is not a trilogy, it's a graduate-level course sequence.
For more information contact Ignacio Tomas at igtomas@ttu.edu
https://www.math.ttu.edu/~igtomas/