Analysis and computation in solid mechanics

D. Reddy

University of Cape Town
daya.reddy@uct.ac.za

Problems in solid mechanics typically take the form mathematically of systems of partial differential equations, inequalities, or as variational problems. Studies of the well-posedness of such problems provide valuable insights into the range of validity of parameters describing material behaviour, and of the models themselves. The development of approximate solutions and accompanying numerical simulations are an essential component of investigations, given the intractability of all but the simplest cases. This presentation will provide an overview of some problems in linear and nonlinear solid mechanics of recent and current interest, with a focus on anisotropic elasticity and elastoplasticity. Key results will be presented on their well-posedness, the development of algorithms for numerical approximations, and the determination of conditions for convergence of such approximations.