Ae/AM/CE/ME 214 ab. Computational Solid Mechanics. 9 units (3-0-6); first, second. Prerequisites: ACM 100 ab or equivalent; CE/AM/Ae 108 ab or equivalent or instructor's permission; Ae/AM/CE/ME 102 abc or Ae/Ge/ME 160 ab or instructor's permission. Introduction to the use of numerical methods in the solution of solid mechanics and multiscale mechanics problems. First term: Variational principles. Finite element analysis. Variational problems in linear and finite kinematics. Time integration, initial boundary value problems. Elasticity and inelasticity. Constitutive modeling. Error estimation. Accuracy, stability and convergence. Iterative solution methods. Adaptive strategies. Second term: Multiscale modeling strategies. Computational homogenization in linear and finite kinematics. Spectral methods. Atomistic modeling and atomistic-to-continuum coupling techniques. Offered FA/WI 2016-17. Instructor: Kochmann.