MME 504: Materials Fracture and Failure Analysis

Type of failures, buckling, fracture in brittle and ductile materials, fractography ,mixed *mode,* and fatigue failures environmental effects, wear, creep, and yielding phenomena ,high strain rate failures, case histories of component failures. Fracture mechanisms and mechanics of solid materials. Topics include: nature of brittle aruLductile fracture, macro-phenomena and micro- mechanisms of failure of various materials, mechanisms of fatigue failure: crack nucleation and propagation, Griffith theory, stress field at crack tips, stress intensity factor and fracture toughness, crack opening displacement, energy principle and the J-integral, fracture mechanics in fatigue, da/dN curves and their significance. Practical examples of fatigue analysis and fundamentals of non-destructive testing.