

MATERIALS SCIENCE (MTSC)

MTSC 4010 Mechanical Behavior of Materials (4 Credits)

Effects of microstructure on mechanical behavior of material; emphasis on recent developments in materials science, fracture, fatigue, creep, wear, corrosion, stress rupture, deformation and residual stress. Cross listed with MTSC 3010.

MTSC 4020 Composite Materials I (4 Credits)

An introduction to composite materials. Properties of fibers and matrices, fiber architecture, elastic properties of laminae and laminates, interface in composites. Cross listed with MTSC 3020.

MTSC 4215 Composite Materials II (4 Credits)

A continuation of MTSC 4210: Strength and toughness of composites, thermal behavior, fabrication methods, examples of applications. Prerequisite: MTSC 4210.

MTSC 4450 Fracture Mechanics (4 Credits)

Topics include stress field at a crack tip, linear elastic fracture mechanics, energy release rate, stress intensity factors, plastic zones, plane stress, plane strain, fracture toughness, Airy stress functions, elastic-plastic fracture mechanics, J integral, crack tip opening displacements, experimental testing, fatigue, life prediction, crack closure, weight functions, failure analysis. Cross listed with MTSC 3450.

MTSC 4800 Advanced Topics (MTSC) (1-5 Credits)

Selected topics (depending on student and faculty interest): fracture mechanics, fatigue, nonlinear constitutive models, dynamic behavior of materials, corrosion resistant design, thermodynamics of solids II.

MTSC 4991 Independent Study (1-10 Credits)**MTSC 4995 Independent Research (1-16 Credits)****MTSC 5995 Independent Research (1-16 Credits)**