

# MATERIALS SCIENCE (MTSC)

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## Courses

### **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 4900 Materials Science Seminar (1 Credit)**

Weekly presentations by graduate students, faculty, outside speakers, etc., on research in progress or other topics of interest.

### **MTSC 4991 Independent Study (1-10 Credits)**

### **MTSC 4992 Directed Study (1-10 Credits)**

### **MTSC 4995 Independent Research (1-16 Credits)**

### **MTSC 5995 Independent Research (1-16 Credits)**