MATERIALS SCIENCE (MTS)

MTS 421 Introduction to Ceramics (3 Credits)
Engineering & Comp Sci
Ceramics as a class of materials composed of inorganic, nonmetallic components. Development, utilization, and control of properties of ceramic materials.

MTS 431 Physical Metallurgy (3 Credits)
Engineering & Comp Sci
Properties of metals and alloys. Transformations and their consequences in practical systems.

MTS 471 Materials for Engineering Applications (3 Credits)
Engineering & Comp Sci
Deformation and fracture of metals, ceramics, and polymers. Materials for applications at high temperatures, corrosive environments, high strengths, and light weights. Prepares students to select materials for certain engineering functions.

MTS 490 Independent Study (1-6 Credits)
Engineering & Comp Sci
Exploration of a problem, or problems, in depth. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor(s) and the department.
Repeatable

MTS 533 Introduction to Theory of Materials (3 Credits)
Engineering & Comp Sci
Theoretical concepts that describe the electronic structure of crystals. Models of electron and ion interactions to correlate electronic, magnetic, and thermal properties of metals, alloys, and compounds.
Shared Competencies: Critical and Creative Thinking (https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/)

MTS 537 Introduction to Diffusion in Solids (3 Credits)
Engineering & Comp Sci
Diffusion mechanisms, diffusion equations and their methods of solution.

MTS 570 Nondestructive Testing (3 Credits)
Engineering & Comp Sci
Determination of defects in structural materials. Nondestructive inspection methods include noise emission techniques, X-ray radiography, leak detectors, ultrasonics, magnetic and electrical methods.
Repeatable

MTS 581 X-Ray Diffraction (3 Credits)
Engineering & Comp Sci
Kinematic theory of X-ray diffraction and its applications in materials science. Experimental methods. Integrated intensity, line broadening, and peak shift analyses. Crystal structure. X-ray effects of imperfections in crystals.