

ME/MSE/PTFE 6796: Structure-Property Relationships in Materials
9:35 – 10:55 am T/R Love (MRDC II) 183

Dr. Nazanin Bassiri-Gharb
315 Love Manufacturing Bldg.
Contact: nazanin.bassirigharb@me.gatech.edu
(404)-385-0667
Office hours: T/R 11-11:30 am

Credit Hours:	3-0-3
Prerequisites:	Graduate standing in engineering or related discipline. 3.0/4.0 or above in MSE2001: Introduction to Materials or equivalent course.
Catalog Description:	Introduction to the multiscale structure effects on material properties. For MSE students, this is a survey course that will lay the foundation for future in-depth courses on specific properties of materials. For non-MSE students, the course will provide a background in materials and may serve as part of the program of study for a minor in materials. Cross-listed ME and MSE.
Reference Material:	R.E. Newnham, "Properties of Materials: Anisotropy, Symmetry, Structure," Oxford University Press W.D. Kingery, H.K. Bowen, D.R. Huhlmann, "Introduction to Ceramics," Wiley Interscience G.S. Rohrer, "Structure and Bonding in Crystalline Materials," Cambridge University Press R.G. Borg, G.J. Dienes, "The Physical Chemistry of Solids," Academic Press
Objective:	To understand how physical and chemical properties are related to atomistic composition, chemical bonding, crystal structure and microstructure of a material.
Topics outline:	Atoms Bonding Solid Solutions and Alloys Phase Transitions Elements of Crystallography Structure-Property Relations: Neumann's Law Thermal Properties Optical Properties Electrical Properties Dielectric Properties Magnetic Properties Mechanical Properties
Grading:	Problem sets: 30%, Midterms (2): 30%, Final 40%