Title: Electromechanical Properties of Materials
Instructor: Professor Keith Bowman – kbowman@ecn.purdue.edu

3 Credits – Open to Graduate Students (undergraduate require permission of instructor)
Thursdays, 6:30-9PM

Recommended background in electronics or materials science – heavy emphasis on applications to piezoelectric materials. Please discuss enrollment with Professor Bowman

The objective of this course is to provide the foundations for understanding the relationships between electrical and mechanical properties of materials. The course will discuss the characteristics of materials that possess these properties and key applications. Cross-property relations, with emphasis on the electromechanical properties of electrostriction and piezoelectricity, will be our primary focus, although applications to optical properties and magnetism will also be discussed. The course will begin with an intensive evaluation of tensors and their application to stress, strain, polarization, conductivity, thermal expansion and elasticity. We will discuss how single crystal tensor properties can be combined to report the properties of composites and polycrystals. The bulk of the course will be highly discussion-oriented, with students taking the course required to lead and participate in discussions.