SE&T Colloquium Series-Fall 2013

Speaker	Dr. Alan Freed Clifford H. Spicer Chair in Engineering Department of Mechanical Engineering
Title	***Mechanics of Soft Tissues:*** ***Reflecting On Roads Traveled and The Road Just Taken***
Abstract	About three-quarters of a century ago saw the emergence of a finite strain theory suitable for modeling natural rubber, which was critical to the war effort. This theory was derived from thermodynamics and has a solid foundation in statistical mechanics. With an application of invariant theory in the 1950's, the explicit theory for rubber elasticity became complete. In the decades that have ensued, rubber elasticity (hyperelasticity) has been applied to a broad selection of materials - some successfully, some not. Of particular interest for this talk are the soft solids of biologic origin. The presentation will reexamine the road well traveled in our attempts to secure a mathematical description for these materials, and it will show that a new fork in the road is worth exploring and developing. In 2003, Prof. K. Rajagopal from Texas A&M introduced an idea that the thermodynamic structure of an elastic material might be implicit in its dependence upon state. This simple notion is causing a profound revolution in our thinking of what an elastic solid is or can be - a revolution that is, unfortunately, slowed by the inertia of bias. Much of this presentation will present what such a theory is capable of predicting. Implicit elasticity today is where explicit elasticity was in the 1950's. There are great opportunities that lie ahead in the continued development of this theory, and in the construction of tools that can apply this technology for use in engineering applications.
Date	Tuesday, October 15
Time	4:10-5:00pm
Place	Pioneer 240
	Refreshments will be served at 4:00pm.