CE 890 Graduate Seminar

SPEAKER: Nassim Rahmani, Ph.D. student in Mech. Engg. at K-State

TOPIC: **"**Characterization of Mechanical and Adhesion Related Properties by Means of Contact Mechanics Theories"

DATE: September 30, 2009

TIME: 4:00 p.m. (refreshments at 3:45 p.m.)

PLACE: 2144 Fiedler Hall

ABSTRACT

From structural plastics to adhesives and paints, polymers (both petro-based and bio-based) are used in nearly every aspect of our daily life. In order for an engineer or material scientist to select an existing polymer and/or design a new polymer for a particular application, it is often necessary to have the knowledge of specific properties for that material.

Although a variety of standardized tests exist for the macro-level property characterization of polymer materials, it is sometimes necessary to characterize these materials at a much smaller (micro-level) scale. The current research focuses on the application of contact mechanics based techniques to perform micro-scale characterization of the mechanical and adhesion-related properties of soy protein based bio-polymer materials. These techniques have the capability of simultaneously providing characterization of the mechanical and adhesion-related properties of the material, as well as providing insight into micro-structural variations within the polymeric material. Although these approaches have been used to investigate petro-based polymers, essentially no published literature exists on their application to bio-based polymer systems.

This presentation will provide a brief introduction to the bio-polymers being evaluated in this project and will then discuss the contact mechanics based techniques that are being employed to evaluate mechanical and adhesion properties of polymeric systems.