“Thin Films and Soft Materials: A Perspective on Research at a PUI”

Wednesday
January 31, 2018
3:00 pm
Wu and Chen Auditorium
Levine Hall

Adam J. Nolte
Head and Associate Professor
Department of Chemical Engineering
Rose-Hulman Institute of Technology

Abstract
In this broad-interest presentation, I will give an overview of three research efforts I have led in the Department of Chemical Engineering at the Rose-Hulman Institute of Technology. In the first part, I will discuss our characterization and study of hysteretic swelling in polyelectrolyte multilayer films in response to changes in environmental humidity. In the second part, I will discuss our development of a method for creating nanostructured, index-tunable antireflection coatings in a single spin-coating step through pH-induced aggregation in a silica nanoparticle precursor solution. I will conclude with some recent results stemming from our efforts to create gelatin-based tissue phantoms for use in the development of a new embedded tumor detection technique. Specifically, I will highlight our efforts towards independent toughness and stiffness control in gelatin through sodium alginate addition. Throughout the talk, I will highlight the challenges, opportunities, and rewards involved in teaching and pursuing research projects at primarily undergraduate institutions like Rose-Hulman.

Bio
Dr. Adam J. Nolte is the Head and Associate Professor of Chemical Engineering at the Rose-Hulman Institute of Technology. Prior to joining Rose-Hulman, Dr. Nolte held a postdoctoral appointment as a Materials Research Engineer in the Polymers Division at the National Institute of Standards and Technology. He holds a B.S. degree in chemical engineering from the University of Missouri-Rolla, and a Ph.D. degree in Materials Science and Engineering from MIT. Dr. Nolte’s research interests are in thin films and polymeric materials, and he enjoys advising interdisciplinary research projects with undergraduate and masters students in these areas.

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