Northeastern University
College *of* Engineering

Please join us for a
Special Chemical Engineering Seminar

Friday, October 4, 2013
108 Snell Engineering
11:45 a.m. – 1:00 p.m.

"System Identification and Modeling of Capillary Melt Rheological Data"

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ABSTRACT

Isayev (1970) teaches that the polymer's relaxation spectrum is a basic characteristic which determines "all manifestations of their viscoelastic properties." Motivated by a brief conversation with Isayev, ongoing efforts are presented to characterize the relaxation spectrum of polymer melts from transient capillary rheological data. Specifically, system identification techniques using an iterative prediction-error minimization (PEM) method are applied to isolate the viscoelastic melt response from the apparatus dynamics. Parameters for linear time invariant (LTI) systems of varying complexity are estimated using capillary rheology across a range of temperatures and shear rates. Work in progress for polystyrene and polypropylene are presented with discussion of implications for development of more robust constitutive models and process simulations.

BIOGRAPHY: David Kazmer is a Professor of Plastics Engineering at UMass Lowell. His expertise is related to polymer processing and includes machine design, instrumentation, process modeling, and control systems. Some recent contributions include multivariate in situ process sensors, simulation of self-assembly of ternary polymer blends, and passive multi-scale assembly methods. He is an inventor with over twenty patents and the author of more than two hundred publications including two books. A Fellow of the American Society of Mechanical Engineers and Society of Plastics Engineers, he is the recipient of over twenty different recognition awards including the Office of Naval Research Young Investigator Award and the National Science Foundation CAREER Award. He has also served at various levels in industry as well as Associate Dean of his College.

Refreshments will be served.