



PennState

**DEPARTMENT OF MECHANICAL AND
NUCLEAR ENGINEERING**

Mechanical Engineering Seminar Series

Chelsey Simmons, PhD.

Department of Mechanical
& Aerospace Engineering
University of Florida



**Tuesday,
April 19, 2016**

**4:00 p.m.
135 Reber Building**

*Snacks will be available before
the seminar at 3:50 p.m.

Please direct any questions regarding
this seminar to Mary Newby at
mln7@psu.edu

Experimental Characterization of Soft Matter for Biomedical Applications

Abstract

Mechanical considerations have gained new status in biological research communities as the importance of the microenvironment in controlling cell behavior continues to grow. Mechanics have been shown to contribute to a wide range of normal and disease conditions, including stem cell differentiation and cancer cell growth and metastasis. To fully understand the biological microenvironment, experimental mechanics methods are being adapted to accommodate soft, sticky, and hydrated materials. Methods must also be appropriate for millimeter-scale tissue samples obtained from laboratory animals and human biopsies.

In this talk, I will emphasize the importance of the mechanical microenvironment to biology and describe techniques we have developed for characterization of soft matter. Applications and recent findings in cardiovascular disease and cancer will be presented and discussed.

Biography

Chelsey S. Simmons, Ph.D., joined the UF Mechanical and Aerospace Engineering faculty at the University of Florida in Fall 2013 following a visiting research position at the Swiss Federal Institute of Technology (ETH) Zurich. Simmons received her B.S. cum laude from Harvard University and her M.S. and Ph.D. from Stanford University. In addition to her engineering research and coursework, Simmons received a Ph.D. Minor in Education and was a founding officer and President of Stanford's American Society for Engineering Education. She also serves on the advisory board of a company based on one of her pending patents. Her research focuses on mechanical design for biomedical benefit: inventing, prototyping and testing microsystems to mimic bodily functions in a dish. Dr. Simmons' research, teaching and service contributions were recently recognized by ASME as one of 2015's "New Faces of Engineering".