



## Department of Chemical Engineering Special Guest Speaker



### Ericka Ford

Assistant Professor  
*Textile Eng, Chemistry & Science*  
NC State University

**Host: Tom Webster**  
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### Engineered Surfaces and Interphases on Fiber Performance

**Wednesday, April 29**  
312 Ell  
11:45am – 1:00pm

*Refreshments will be served*

**ABSTRACT** Techniques for making novel materials include the use of nanoscale fillers and surface coatings. By these means, functionality that is not inherent to pristine fibers can be achieved. This talk will discuss the role of surface chemistry on fiber and textile performance in these areas: self-decontaminating membranes, barrier selective coatings, and wrinkle resistant finishes. Even more unique to nanocomposites is the role of interphase phenomenon on the mechanical properties of materials. Carbon nanotubes (CNTs) are structural fillers for polymer arrangement and reinforcement. Interestingly, in a study of biohybrid membranes, containing enzymatic proteins and CNTs, CNTs had enhanced the catalytic degradation of hazardous organophosphate agents. This outcome was attributed to surface phenomena that only occurred when CNTs were added to electrospun nanofibers. In another study, the incorporation of CNTs resulted in the strengthening of solution spun fibers. Electrospraying has also been explored as a technique that can render paper liners for corrugated board water resistant and breathable at the same time. Coating morphology and composition had a significant influence on this outcome. Soy oil derivatives were investigated as formaldehyde-free crosslinkers for cotton fabrics. Their chemistry and location in the

cellulose microstructure was key to performance.

**BIOGRAPHY** Dr. Ericka Ford holds a joint Assistant Professorship between Textile Engineering, Chemistry and Science Department and The Nonwovens Institute. The Ford Innovation Team currently performs fiber research to achieve high strength and functionality, which is enabled through interfacial phenomenon and techniques for fiber processing. Prior to joining the faculty at North Carolina State University, she was as a National Research Council postdoctoral awardee in Chemical and Biological Defense, Science and Technology at the US Army Natick Soldier Research, Development and Engineering Center from 2013 - 2014. Dr. Ford holds bachelors in science and doctoral degrees in polymer, textiles and fiber engineering from Georgia Institute of Technology. Both degrees were awarded in 2003 and 2012, respectively. She received a masters in polymer science from the University of Southern Mississippi in 2007. As a graduate student, she participated in two NSF-supported IGERTs for integrated graduate education and research training, wherein she studied the commercialization of polymers and fiber technologies.