## **CHEMICAL, BIOLOGICAL & MATERIALS ENGINEERING**

100 E. Boyd, Sarkeys Energy Center, T-335
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The University of Oklahoma
Norman, Oklahoma
2011 – 2012 Seminar Series

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CIVIL, ARCHITECURAL AND ENVIRONMENTAL ENGINEERING
DREXEL UNIVERSITY
PHILADELPHIA, PENNSYLVANIA

Will present a seminar on

## "TECHNOLOGICAL, CLIMATE CHANGE AND SUSTAINABILITY FEATURES OF EMERGING BIOFUELS"

To address global climate change and sustainability goals, federal and state renewable fuel standards (RFS's) or low carbon fuel standards (LCFS's) in the U.S., Canada, the U.K., Germany, and elsewhere, and in California, directly or implicitly require blenders of transportation fuels to use fuel components such as bioethanol in their products. These components must be shown to have lower greenhouse gas (GHG) emissions relative to conventional petroleum on the basis of life cycle assessment (LCA). Estimating the GHG intensity of such fuels with a high degree of confidence requires the use of probabilistic methods to account for known sources of uncertainty. This presentation will discuss the construction of and analytical results from a stochastic LCA model for better predicting the GHG "footprint" of 2<sup>nd</sup> generation ethanol fuel produced via bioconversion of agricultural residue (corn stover) and energy crops (switchgrass). Using statistical methods to identify significant model variables from public datasets and chemical process simulation, this work applied Monte Carlo simulation to estimate stochastic life cycle GHG emissions for the two feedstocks combined with two promising fuel conversion technologies. The approach can be generalized to other biofuel or more generally, liquid fuel systems. This presentation will highlight how analytical models for understanding the full set of environmental tradeoffs associated with emerging fuel technologies are essential inputs to guiding decision making and for improving the overall sustainability of transportation energy supply.

THURSDAY, NOVEMBER 10, 2011
COOKIES AND COFFEE -- 2:45 P.M.
SEMINAR -- 3:00 P.M.
SARKEYS ENERGY CENTER, ROOM M-204

THIS IS A REQUIRED SEMINAR FOR CHE 5971

Accommodations on the basis of disability are available by contacting the office before the event.