

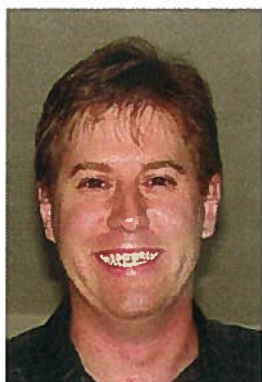
# 2008-2009 Graduate Seminar Series

## The Department of Mechanical Engineering – Engineering Mechanics

Proudly Presents

### Professor Scott Miers

Michigan Technological University



Dr. Miers joined the Mechanical Engineering-Engineering Mechanics department at Michigan Tech this fall. His research interests and expertise include experimental internal combustion engine research focusing on gasoline and diesel combustion, system efficiency and emissions reduction. He has experience with novel IC engine data acquisition techniques such as piston-mounted wireless microwave telemetry and minimally invasive combustion visualization. In addition, he has a significant interest in alternative and renewable transportation fuels and has worked with biodiesel, ethanol, butanol and Fischer-Tropsch synthetic fuels in both spark-ignition and compression-ignition engines.

Dr. Miers received his Ph.D. from Michigan Tech in 2004. His dissertation was entitled, "Identification and Characterization of Impingement Signatures in a High Speed Diesel Engine Using Piston Surface Temperature Measurements." After graduating he was employed by Argonne National Laboratory in the Engines and Emissions Research section where his focus continued to be on internal combustion engine efficiency, emissions and performance. He was also closely involved with alternative and renewable fuels research and how the unique chemical compositions affect both engine and vehicle operation.

Dr. Miers is an active member of SAE and the Internal Combustion Engine Division within ASME where he presents his current research, helps organize conference sessions and reviews technical papers for publication acceptance.

Thursday, Sept. 18, 2008    3:00 – 4:00 p.m.    Room 112, ME-EM Bldg.

### Alternative and Renewable Transportation Fuel Research to Improve National Security

The growing dependency of the United States on foreign oil has increased the importance of research in alternative and renewable transportation energy sources. Specifically, biodiesel, ethanol, butanol and diesel fuel derived from biomass through the Fischer-Tropsch process are all feasible options to help reduce dependence on petroleum fuel. To encourage active research in this area, the U.S. government passed the Renewable Fuel Standard (RFS) that makes it a requirement to increase the production of ethanol and advanced biofuels to 36 billion gallons by 2022. Ethanol will be capped at 15 billion gallons, which leaves 21 billion gallons to come from other sources, such as biodiesel, butanol, and other advanced biofuels.

This presentation will cover recent results from engine and vehicle testing of alternative and renewable fuels such as those listed in the RFS. The effect of vegetable oil and biodiesel on the fuel spray characteristics will be presented including correlations between fuel properties and observed spray phenomena. Engine test results using a wood chip based, Fischer-Tropsch derived synthetic diesel fuel will also be presented, including in-cylinder combustion visualization movies. Finally, the advantage of butanol as a flexible renewable transportation fuel will be shown as results are presented from both spark-ignition and compression ignition engines operating on butanol fuel.

Funding for the ME-EM Graduate Seminar Series is provided by Professional Plating, Inc. of Anoka, MN [www.proplate.com](http://www.proplate.com)  
and the Department of Mechanical Engineering – Engineering Mechanics [www.me.mtu.edu/seminar](http://www.me.mtu.edu/seminar)