Post-Conference Training

June 6-7, 2012 (Wed-Thur), 9a-5p, **University of Michigan-Dearborn**
(two days, includes light continental breakfast at 8:30am, lunch each day)

Please Note: Final course selection, BASED ON REGISTRATION RESPONSE, will be announced May 1, 2012.
Registration Confirmations will be sent to registered students after this date.

Course Fee: $450 (Students with valid ID: $250)

Optimization Using LS-OPT® and LS-DYNA®

Instructor: Nielen Stander, Ph.D.

Objective:

To provide an understanding of simulation-based optimization using LS-OPT® and LS-DYNA®. The class presents an opportunity to become familiar with LS-OPT Version 4.2. The graphical user interface is used to teach input preparation and post-processing.

1. **Optimization Theory**. Fundamentals, Experimental Design, Metamodeling, Optimization, Examples.
2. **Running LS-OPT and using the post-processor.** Run LS-OPT and do post-processing using the Viewer.
3. **Simple Optimization with LS-DYNA.** Learn how to set up a simple optimization problem from the start. Make design revisions such as adding simulations or changing the design formulation. Run an automated optimization.
4. **Import Analysis Results table.** Import existing analysis results and conduct an optimization run without new simulations.
5. **Direct Optimization.** Direct Optimization using the genetic algorithm with LS-DYNA as solver.
6. **Multi-Objective Optimization.** Learn how to set up a simple LS-DYNA example with multiple objectives. Both direct and metamodel-based examples.
7. **User-defined example.** Learn the setup for optimization using user-defined (i.e. non-DYNA) simulations. Neural net applications.
8. **Modal Analysis and Tracking.** Learn how to set up an optimization problem with frequency constraints and mode tracking, using the LS-DYNA implicit analysis. Select the most important variables using design sensitivities.
9. **Multi-disciplinary optimization.** Learn how to set up an optimization problem with more than one case or discipline. Combines crashworthiness with frequency criteria in a single design using the explicit and implicit versions of LS-DYNA.
10. **System Identification.** A problem to identify material parameters from experimental results. Set up a multi-case problem. Confidence intervals. Methods include both the classical ordinate-based method as well as the new *Curve Mapping* approach, designed for material calibration using general response history curves or crossplots.