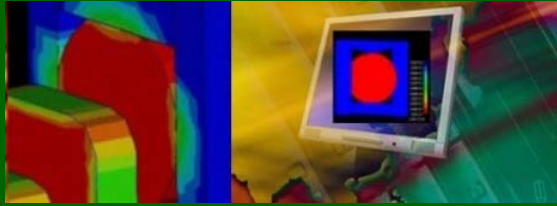


11th Int'l LS-DYNA Users Conference Training Courses
Wednesday & Thursday, June 09-10, 2010



Training Course Registration: 8:00 a.m.
Training Courses Held: 9:00 a.m - 5:00 p.m.

Continental Breakfast/Lunch both days

Using LS-DYNA for Heat Transfer with Hot Stamping Applications
Instructor: Dr. Arthur B. Shapiro

The course objective is to provide an understanding of computational finite element heat transfer. Presentations 1-6 focus on the various heat transfer modeling issues one must understand in using LS-DYNA. This is followed by presentations 7 and 8, which are an introduction to thermal-stress problems with a focus on sheet metal forming. Workshop problems are used to illustrate the points made in the lectures.

Presentations include:

- **Introduction** – Learn to create a KEYWORD input file to solve for the thermal expansion of an aluminum block. Learn LS-PrePost commands to display temperature and heat flux.
- **Mathematical Theory** – brief, but can't be avoided
- **Equation Solvers** - Learn the advantages and disadvantages between the Gauss direct solvers & conjugate gradient iterative solvers in LS-DYNA.
- **Time Step Control** – Learn how to select a time step size, use the variable time step option, and understand the difference between fully implicit and Crank Nicolson time integration methods.
- **Nonlinear Problems** – Learn the nonlinear heat transfer keyword parameters by solving a radiation problem and a solid-liquid phase change problem.
- **Boundary Conditions** – Learn how to define temperature, flux, convection, and radiation boundary conditions. Learn how to hand calculate a convection heat transfer coefficient.
- **Thermal Contact** – Learn thermal contact modeling issues by solving a sheet metal forming problem with thin and thick shells.
- **Thermal-stress coupling** – An introduction to coupled thermal stress modeling with a focus on sheet metal forming applications.
- **Thermal-fluids** – Learn 3 modeling techniques for pipe flow: (1) BULKFLOW, (2) pipe network flow, and (3) ALE.
- **Miscellaneous** – A quick overview of miscellaneous modeling topics (e.g., powders, welding, thermostats, MEMS, etc.).
- **Hot Forming Process** - fringes of temperature

For training inquiries contact Cathie – Cathie@lstc.com