Introductory LS-DYNA Training Class

Class Location: **Livermore Software Technology Corporation**
7374 Las Positas Road
Livermore, CA 94551

Contact: Jane Hallquist
925-245-4572 phone
jane@lstc.com

Objective of the course
Learn how to run LS-DYNA to solve engineering problems. Detailed descriptions are given of the data required to run LS-DYNA analysis. Examples are used to illustrate the points made in the lectures.

Who should attend
This course is recommended for engineers who want to use LS-DYNA to perform nonlinear static and dynamic impact simulations. Engineers working in the aerospace, automotive, and civil, manufacturing, packaging industries and government organizations will benefit from this course. This course is useful for engineers and researchers who are working in the area of deformation and strength of isotropic, composite, and most common materials as well as those who are working on biomechanics problems.

Lectures begin daily at 9:00 a.m. and run until 5:30 p.m., except for the last day when the course concludes at 12:00 p.m. The classroom machines are PCs running on the Linux operating system.

COURSE CONTENTS:

Course Outline
History
Finite Element Simulation
- Sample LS-DYNA Conference Presentations
- Sample Simulations

FE Analysis (preprocessors, solver, postprocessors)
Details of an Example (Tube Collapse)
- LS-DYNA Deck
- Using LS-POST
- Details of Postprocessing

Detailed Capabilities-Keyword Format
Material Nonlinearity
Running LS-DYNA
- Execution and Output Files
  - ASCII
  - BINERY

Output Control
FE Modeling Techniques
- Engineering a FEA Model
- Element Selection
  - Discrete (formulation of elastic and nonlinear elastic spring)
  - Beam
  - Shell (description of the various shell formulations)
  - Solid (description of the various solid formulations)
  - Thick Shell
- Mesh Density
  - Guidelines for vehicle frontal impact simulation (as an example)
- Boundary, and Initial Conditions, Symmetry
- Modeling for Physical Phenomenon
- Ad-Hoc Guidelines
- How to Tell if your Results are Correct

Error, debugging, and other useful information (d3hsp)
SW5 interactive graphics

Time Integration

The Equations of Motion
Implicit
Explicit

Explicit Time Integration

Time Step Calculation

Reduce–Selective Integration

Hourglass Phenomenon

Contact and Slide Surfaces

Friction

Damping

Restart

Quasi-Static Simulations

Why Static Analysis With Explicit Code
Time Scaling
Mass Scaling