



# Advanced LS-DYNA Training in Impact Analysis

A short course taught by: Paul A.. Du Bois

Class Location: **Livermore Software Technology Corporation**  
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## **Objective of the course**

This is an advanced course about the use of LS-DYNA for the simulation of (automotive) crashworthiness problems. We explain how careful modeling and a profound understanding of the numerical methodology can help the engineer in producing reliable and precise simulations for a wide class of problems. Every crash simulation is a compromise between precisions and cost, thus the user must be conscious of the advantages and disadvantages of the different software options that are made available. The course is a combination of presentations and workshops.

## **Who should attend**

This seminar is intended for engineers who have already acquired a basic knowledge about the use of explicit software. We think of new members of the crashworthiness simulation teams in the automotive companies, component suppliers or engineering firms. It could also benefit engineers working in any transportation industry that is confronted with crashworthiness 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:**

### **DAY 1**

- General Introduction
- History, Potential & Limitations of the Technology
- Modeling for Crashworthiness
- Modeling Guidelines for Small & Large Displacement Problems
- Workshop on Shell Elements

### **DAY 2**

- Elasto-Plastic Materials for Metal and Foam
- Visco-Plastic Materials for Foam, Plastic, and Rubber
- Overview of Foams (soft PU, EA-PU, EPS...)
- Workshop on Material Models

### **DAY 3**

- Modeling of Dummies and Impactors (201-Pedestrian)
- Including Determination of Material Parameters
- Airbag Simulations
- Reference Geometry Versus Folded Bag
- Workshop on User-Subroutine Implementation

### **DAY 4**

- Simple Optimization Techniques
- Side-Impact Simulations and Component Models
- Barrier Modeling and Small Strain Formulations
- Discussion, Q&A